US012218893B2

(12) **United States Patent**
Desserrey et al.

(10) **Patent No.: US 12,218,893 B2**
(45) **Date of Patent: *Feb. 4, 2025**

(54) **USER PRESENCE INDICATION DATA MANAGEMENT**

(71) Applicant: **Snap Inc.**, Santa Monica, CA (US)

(72) Inventors: **Laurent Desserrey**, Los Angeles, CA (US); **Dylan Shane Eirinberg**, Venice, CA (US); **Jeremy Baker Voss**, Los Angeles, CA (US)

(73) Assignee: **SNAP INC.**, Santa Monica, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **18/680,714**

(22) Filed: **May 31, 2024**

(65) **Prior Publication Data**

US 2024/0323151 A1 Sep. 26, 2024

Related U.S. Application Data

(63) Continuation of application No. 17/397,366, filed on Aug. 9, 2021, now Pat. No. 12,034,680.
(Continued)

(51) **Int. Cl.**
H04L 51/043 (2022.01)
H04L 51/216 (2022.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04L 51/043*** (2013.01); ***H04L 51/216*** (2022.05); ***H04L 51/52*** (2022.05); ***H04L 67/535*** (2022.05); ***H04L 67/54*** (2022.05)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,754,939 A 5/1998 Herz et al.
5,880,731 A 3/1999 Liles et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2887596 A1 7/2015
CN 109863532 A 6/2019
(Continued)

OTHER PUBLICATIONS

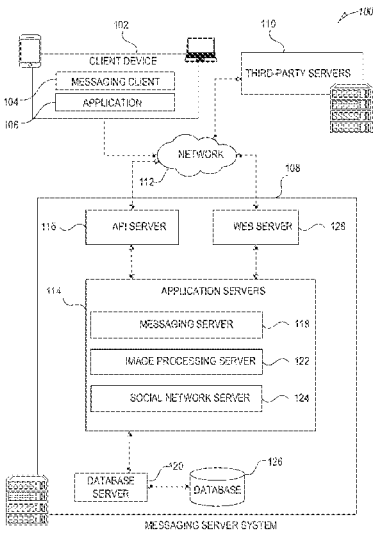
"U.S. Appl. No. 17/397,366, Corrected Notice of Allowability mailed Jun. 5, 2024", 2 pgs.
(Continued)

Primary Examiner — June Sison
(74) *Attorney, Agent, or Firm* — SCHWEGMAN LUNDBERG & WOESSNER, P.A.

(57) **ABSTRACT**

A method and a system include receiving a first message from a first device associated with a first user, the first message being associated with a group conversation between plural users including the first user and a second user, the group conversation comprising a main conversation view and first experience page; determining the first message was transmitted from the first experience page; detecting the first user being active within the first experience page and the second user being active within the main conversation view; and causing display of the first message, a name of the first user, and a page source graphical element indicating the first experience page on a second device associated with the second user.

20 Claims, 13 Drawing Sheets



Related U.S. Application Data

(60) Provisional application No. 63/168,514, filed on Mar. 31, 2021.

(51) **Int. Cl.**

H04L 51/52	(2022.01)
H04L 67/50	(2022.01)
H04L 67/54	(2022.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,023,270	A	2/2000	Brush, II et al.
6,038,295	A	3/2000	Mattes
6,158,044	A	12/2000	Tibbetts
6,167,435	A	12/2000	Druckenmiller et al.
6,205,432	B1	3/2001	Gabbard et al.
6,223,165	B1	4/2001	Lauffer
6,310,694	B1	10/2001	Okimoto et al.
6,484,196	B1	11/2002	Maurille
6,487,586	B2	11/2002	Ogilvie et al.
6,665,531	B1	12/2003	Soderbacka et al.
6,701,347	B1	3/2004	Ogilvie
6,711,608	B1	3/2004	Ogilvie
6,757,713	B1	6/2004	Ogilvie et al.
6,772,195	B1	8/2004	Hatlelid et al.
6,842,779	B1	1/2005	Nishizawa
6,980,909	B2	12/2005	Root et al.
7,124,164	B1	10/2006	Chemtob
7,149,893	B1	12/2006	Leonard et al.
7,173,651	B1	2/2007	Knowles
7,243,163	B1	7/2007	Friend et al.
7,278,168	B1	10/2007	Chaudhury et al.
7,342,587	B2	3/2008	Danzig et al.
7,356,564	B2	4/2008	Hartselle et al.
7,376,715	B2	5/2008	Cunningham et al.
7,411,493	B2	8/2008	Smith
7,468,729	B1	12/2008	Levinson
7,478,402	B2	1/2009	Christensen et al.
7,496,347	B2	2/2009	Puranik
7,519,670	B2	4/2009	Hagale et al.
7,535,890	B2	5/2009	Rojas
7,607,096	B2	10/2009	Oreizy et al.
7,636,755	B2	12/2009	Blattner et al.
7,639,251	B2	12/2009	Gu et al.
7,703,140	B2	4/2010	Nath et al.
7,775,885	B2	8/2010	Van Luchene et al.
7,859,551	B2	12/2010	Bulman et al.
7,885,931	B2	2/2011	Seo et al.
7,912,896	B2	3/2011	Wolovitz et al.
7,925,703	B2	4/2011	Dinan et al.
8,088,044	B2	1/2012	Tchao et al.
8,095,878	B2	1/2012	Bates et al.
8,108,774	B2	1/2012	Finn et al.
8,117,281	B2	2/2012	Robinson et al.
8,130,219	B2	3/2012	Fleury et al.
8,131,597	B2	3/2012	Hudetz
8,146,005	B2	3/2012	Jones et al.
8,151,191	B2	4/2012	Nicol
8,170,957	B2	5/2012	Richard
8,199,747	B2	6/2012	Rojas et al.
8,214,443	B2	7/2012	Hamburg
8,238,947	B2	8/2012	Lottin et al.
8,244,593	B2	8/2012	Klinger et al.
8,312,097	B1	11/2012	Siegel et al.
8,332,475	B2	12/2012	Rosen et al.
8,384,719	B2	2/2013	Reville et al.
RE44,054	E	3/2013	Kim
8,396,708	B2	3/2013	Park et al.
8,425,322	B2	4/2013	Gillo et al.
8,458,601	B2	6/2013	Castelli et al.
8,462,198	B2	6/2013	Lin et al.
8,484,158	B2	7/2013	Deluca et al.
8,495,503	B2	7/2013	Brown et al.
8,495,505	B2	7/2013	Smith et al.
8,504,926	B2	8/2013	Wolf
8,559,980	B2	10/2013	Pujol
8,564,621	B2	10/2013	Branson et al.
8,564,710	B2	10/2013	Nonaka et al.
8,570,907	B2	10/2013	Garcia, Jr. et al.
8,581,911	B2	11/2013	Becker et al.
8,597,121	B2	12/2013	Andres del Valle
8,601,051	B2	12/2013	Wang
8,601,379	B2	12/2013	Marks et al.
8,632,408	B2	1/2014	Gillo et al.
8,648,865	B2	2/2014	Dawson et al.
8,659,548	B2	2/2014	Hildreth
8,683,354	B2	3/2014	Khandelwal et al.
8,692,830	B2	4/2014	Nelson et al.
8,718,333	B2	5/2014	Wolf et al.
8,724,622	B2	5/2014	Rojas
8,745,132	B2	6/2014	Obradovich
8,810,513	B2	8/2014	Ptucha et al.
8,812,171	B2	8/2014	Filev et al.
8,832,201	B2	9/2014	Wall
8,832,552	B2	9/2014	Arrasvuori et al.
8,839,327	B2	9/2014	Amento et al.
8,874,677	B2	10/2014	Rosen et al.
8,890,926	B2	11/2014	Tandon et al.
8,892,999	B2	11/2014	Nims et al.
8,909,679	B2	12/2014	Root et al.
8,909,714	B2	12/2014	Agarwal et al.
8,909,725	B1	12/2014	Sehn
8,914,752	B1	12/2014	Spiegel
8,924,250	B2	12/2014	Bates et al.
8,963,926	B2	2/2015	Brown et al.
8,989,786	B2	3/2015	Feghali
8,995,433	B2	3/2015	Rojas
9,040,574	B2	5/2015	Wang et al.
9,055,416	B2	6/2015	Rosen et al.
9,083,770	B1	7/2015	Drose et al.
9,086,776	B2	7/2015	Ye et al.
9,094,137	B1	7/2015	Sehn et al.
9,100,806	B2	8/2015	Rosen et al.
9,100,807	B2	8/2015	Rosen et al.
9,105,014	B2	8/2015	Collet et al.
9,113,301	B1	8/2015	Spiegel et al.
9,148,424	B1	9/2015	Yang
9,191,776	B2	11/2015	Root et al.
9,204,252	B2	12/2015	Root
9,225,805	B2	12/2015	Kujawa et al.
9,225,897	B1	12/2015	Sehn et al.
9,237,202	B1	1/2016	Sehn
9,241,184	B2	1/2016	Weerasinghe
9,256,860	B2	2/2016	Herger et al.
9,264,463	B2	2/2016	Rubinstein et al.
9,276,886	B1	3/2016	Samaranayake
9,294,425	B1	3/2016	Son
9,298,257	B2	3/2016	Hwang et al.
9,314,692	B2	4/2016	Konoplev et al.
9,330,483	B2	5/2016	Du et al.
9,357,174	B2	5/2016	Li et al.
9,361,510	B2	6/2016	Yao et al.
9,378,576	B2	6/2016	Bouaziz et al.
9,385,983	B1	7/2016	Sehn
9,396,354	B1	7/2016	Murphy et al.
9,402,057	B2	7/2016	Kaytaz et al.
9,407,712	B1	8/2016	Sehn
9,407,816	B1	8/2016	Sehn
9,412,192	B2	8/2016	Mandel et al.
9,430,783	B1	8/2016	Sehn
9,443,227	B2	9/2016	Evans et al.
9,460,541	B2	10/2016	Li et al.
9,482,882	B1	11/2016	Hanover et al.
9,482,883	B1	11/2016	Meisenholder
9,489,661	B2	11/2016	Evans et al.
9,489,760	B2	11/2016	Li et al.
9,491,134	B2	11/2016	Rosen et al.
9,503,845	B2	11/2016	Vincent
9,508,197	B2	11/2016	Quinn et al.
9,532,171	B2	12/2016	Allen et al.
9,537,811	B2	1/2017	Allen et al.
9,544,257	B2	1/2017	Ogundokun et al.
9,560,006	B2	1/2017	Prado et al.
9,576,400	B2	2/2017	Van Os et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,589,357 B2 3/2017 Li et al.
9,592,449 B2 3/2017 Barbalet et al.
9,628,950 B1 4/2017 Noeth et al.
9,648,376 B2 5/2017 Chang et al.
9,652,896 B1 5/2017 Jurgenson et al.
9,659,244 B2 5/2017 Anderton et al.
9,693,191 B2 6/2017 Sehn
9,697,635 B2 7/2017 Quinn et al.
9,705,831 B2 7/2017 Spiegel
9,706,040 B2 7/2017 Kadirvel et al.
9,742,713 B2 8/2017 Spiegel et al.
9,744,466 B2 8/2017 Fujioka
9,746,990 B2 8/2017 Anderson et al.
9,749,270 B2 8/2017 Collet et al.
9,785,796 B1 10/2017 Murphy et al.
9,792,714 B2 10/2017 Li et al.
9,825,898 B2 11/2017 Sehn
9,839,844 B2 12/2017 Dunstan et al.
9,854,219 B2 12/2017 Sehn
9,883,838 B2 2/2018 Kaleal, III et al.
9,898,849 B2 2/2018 Du et al.
9,911,073 B1 3/2018 Spiegel et al.
9,936,165 B2 4/2018 Li et al.
9,959,037 B2 5/2018 Chaudhri et al.
9,961,520 B2 5/2018 Brooks et al.
9,980,100 B1 5/2018 Charlton et al.
9,990,373 B2 6/2018 Fortkort
10,039,988 B2 8/2018 Lobb et al.
10,097,492 B2 10/2018 Tsuda et al.
10,116,598 B2 10/2018 Tucker et al.
10,155,168 B2 12/2018 Blackstock et al.
10,242,477 B1 3/2019 Charlton et al.
10,242,503 B2 3/2019 McPhee et al.
10,262,250 B1 4/2019 Spiegel et al.
10,362,219 B2 7/2019 Wilson et al.
10,475,225 B2 11/2019 Park et al.
10,504,266 B2 12/2019 Blattner et al.
10,516,851 B1 12/2019 Eirinberg et al.
10,573,048 B2 2/2020 Ni et al.
10,657,701 B2 5/2020 Osman et al.
10,913,004 B1 2/2021 Wu et al.
11,196,963 B1 12/2021 Dipasquale et al.
11,307,747 B2 4/2022 Dancie et al.
12,034,680 B2 7/2024 Desserrey et al.
2002/0047868 A1 4/2002 Miyazawa
2002/0067362 A1 6/2002 Agostino Nocera et al.
2002/0144154 A1 10/2002 Tomkow
2002/0169644 A1 11/2002 Greene
2003/0052925 A1 3/2003 Daimon et al.
2003/0126215 A1 7/2003 Udell
2003/0217106 A1 11/2003 Adar et al.
2004/0203959 A1 10/2004 Coombes
2005/0097176 A1 5/2005 Schatz et al.
2005/0162419 A1 7/2005 Kim et al.
2005/0198128 A1 9/2005 Anderson
2005/0206610 A1 9/2005 Cordelli
2005/0223066 A1 10/2005 Buchheit et al.
2006/0002315 A1 1/2006 Theurer et al.
2006/0242239 A1 10/2006 Morishima et al.
2006/0270419 A1 11/2006 Crowley et al.
2006/0294465 A1 12/2006 Ronen et al.
2007/0038715 A1 2/2007 Collins et al.
2007/0047697 A1 3/2007 Drewry et al.
2007/0064899 A1 3/2007 Boss et al.
2007/0073823 A1 3/2007 Cohen et al.
2007/0113181 A1 5/2007 Blattner et al.
2007/0168863 A1 7/2007 Blattner et al.
2007/0176921 A1 8/2007 Iwasaki et al.
2007/0214216 A1 9/2007 Carrer et al.
2007/0233801 A1 10/2007 Eren et al.
2008/0055269 A1 3/2008 Lemay et al.
2008/0120409 A1 5/2008 Sun et al.
2008/0158222 A1 7/2008 Li et al.
2008/0207176 A1 8/2008 Brackbill et al.
2008/0270938 A1 10/2008 Carlson
2008/0306826 A1 12/2008 Kramer et al.
2008/0313346 A1 12/2008 Kujawa et al.
2009/0016617 A1 1/2009 Bregman-Amitai et al.
2009/0042588 A1 2/2009 Lottin et al.
2009/0055484 A1 2/2009 Vuong et al.
2009/0070688 A1 3/2009 Gyorfi et al.
2009/0099925 A1 4/2009 Mehta et al.
2009/0106672 A1 4/2009 Burstrom
2009/0132453 A1 5/2009 Hangartner et al.
2009/0158170 A1 6/2009 Narayanan et al.
2009/0177976 A1 7/2009 Bokor et al.
2009/0202114 A1 8/2009 Morin et al.
2009/0265604 A1 10/2009 Howard et al.
2009/0300525 A1 12/2009 Jolliff et al.
2009/0303984 A1 12/2009 Clark et al.
2010/0011422 A1 1/2010 Mason et al.
2010/0023885 A1 1/2010 Reville et al.
2010/0082427 A1 4/2010 Burgener et al.
2010/0115426 A1 5/2010 Liu et al.
2010/0131880 A1 5/2010 Lee et al.
2010/0162149 A1 6/2010 Sheleheda et al.
2010/0185665 A1 7/2010 Horn et al.
2010/0203968 A1 8/2010 Gill et al.
2010/0227682 A1 9/2010 Reville et al.
2010/0306669 A1 12/2010 Della Pasqua
2011/0093780 A1 4/2011 Dunn
2011/0099507 A1 4/2011 Nesladek et al.
2011/0115798 A1 5/2011 Nayar et al.
2011/0145564 A1 6/2011 Moshir et al.
2011/0148864 A1 6/2011 Lee et al.
2011/0202598 A1 8/2011 Evans et al.
2011/0213845 A1 9/2011 Logan et al.
2011/0239136 A1 9/2011 Goldman et al.
2011/0282959 A1 11/2011 Anderson
2011/0286586 A1 11/2011 Saylor et al.
2011/0320373 A1 12/2011 Lee et al.
2012/0028659 A1 2/2012 Whitney et al.
2012/0113106 A1 5/2012 Choi et al.
2012/0124458 A1 5/2012 Cruzada
2012/0130717 A1 5/2012 Xu et al.
2012/0184248 A1 7/2012 Speede
2012/0209921 A1 8/2012 Adafin et al.
2012/0209924 A1 8/2012 Evans et al.
2012/0254325 A1 10/2012 Majeti et al.
2012/0278692 A1 11/2012 Shi
2012/0304080 A1 11/2012 Wormald et al.
2013/0071093 A1 3/2013 Hanks et al.
2013/0103760 A1 4/2013 Golding et al.
2013/0194301 A1 8/2013 Robbins et al.
2013/0201187 A1 8/2013 Tong et al.
2013/0249948 A1 9/2013 Reitan
2013/0257877 A1 10/2013 Davis
2013/0290443 A1 10/2013 Collins et al.
2014/0032682 A1 1/2014 Prado et al.
2014/0043329 A1 2/2014 Wang et al.
2014/0055554 A1 2/2014 Du et al.
2014/0122787 A1 5/2014 Shalvi et al.
2014/0125678 A1 5/2014 Wang et al.
2014/0129343 A1 5/2014 Finster et al.
2014/0201527 A1 7/2014 Krivorot
2014/0267550 A1 9/2014 Nimri et al.
2014/0282096 A1 9/2014 Rubinstein et al.
2014/0325383 A1 10/2014 Brown et al.
2014/0359024 A1 12/2014 Spiegel
2014/0359032 A1 12/2014 Spiegel et al.
2015/0195097 A1 7/2015 Grigsby et al.
2015/0199082 A1 7/2015 Scholler et al.
2015/0206349 A1 7/2015 Rosenthal et al.
2015/0227602 A1 8/2015 Ramu et al.
2016/0085773 A1 3/2016 Chang et al.
2016/0085863 A1 3/2016 Allen et al.
2016/0086670 A1 3/2016 Gross et al.
2016/0099901 A1 4/2016 Allen et al.
2016/0134840 A1 5/2016 Mcculloch
2016/0180887 A1 6/2016 Sehn
2016/0234149 A1 8/2016 Tsuda et al.
2016/0277419 A1 9/2016 Allen et al.
2016/0321708 A1 11/2016 Sehn
2016/0359957 A1 12/2016 Laliberte

(56) **References Cited**

U.S. PATENT DOCUMENTS

2016/0359987	A1	12/2016	Laliberte
2017/0080346	A1	3/2017	Abbas
2017/0087473	A1	3/2017	Siegel et al.
2017/0113140	A1	4/2017	Blackstock et al.
2017/0118145	A1	4/2017	Aittoniemi et al.
2017/0161382	A1	6/2017	Ouimet et al.
2017/0199855	A1	7/2017	Fishbeck
2017/0235848	A1	8/2017	Van Dusen et al.
2017/0263029	A1	9/2017	Yan et al.
2017/0287006	A1	10/2017	Azmoodeh et al.
2017/0295250	A1	10/2017	Samaranayake et al.
2017/0310934	A1	10/2017	Du et al.
2017/0312634	A1	11/2017	Ledoux et al.
2017/0374003	A1	12/2017	Allen et al.
2017/0374508	A1	12/2017	Davis et al.
2018/0047200	A1	2/2018	O'hara et al.
2018/0113587	A1	4/2018	Allen et al.
2018/0115503	A1	4/2018	Baldwin et al.
2018/0147494	A1	5/2018	Curtis et al.
2018/0241705	A1	8/2018	Sarafa et al.
2018/0315076	A1	11/2018	Andreou
2018/0315133	A1	11/2018	Brody et al.
2018/0315134	A1	11/2018	Amitay et al.
2018/0351903	A1	12/2018	Allen et al.
2018/0367483	A1	12/2018	Rodriguez et al.
2019/0001223	A1	1/2019	Blackstock et al.
2019/0036989	A1	1/2019	Eirinberg et al.
2019/0057616	A1	2/2019	Cohen et al.
2019/0132405	A1	5/2019	Song et al.
2019/0155459	A1	5/2019	Chen et al.
2019/0171338	A1	6/2019	Voss et al.
2019/0188920	A1	6/2019	Mcphee et al.
2020/0028815	A1	1/2020	He et al.
2020/0336454	A1	10/2020	Grantham et al.
2020/0366630	A1	11/2020	Gorny et al.
2021/0303140	A1	9/2021	Mourkogiannis
2022/0094652	A1	3/2022	Lankage
2022/0094653	A1	3/2022	Boyd et al.
2022/0100331	A1	3/2022	Desserrey et al.
2022/0115020	A1	4/2022	Bradley et al.
2022/0321509	A1	10/2022	Desserrey et al.
2022/0321510	A1	10/2022	Desserrey et al.

FOREIGN PATENT DOCUMENTS

CN	110168478	A	8/2019
CN	117121461	A	11/2023
CN	117136533	A	11/2023
EP	2184092	A2	5/2010
JP	2001230801	A	8/2001
JP	5497931	B2	3/2014
KR	101445263	B1	9/2014
WO	WO-2003094072	A1	11/2003
WO	WO-2004095308	A1	11/2004
WO	WO-2006107182	A1	10/2006
WO	WO-2007134402	A1	11/2007
WO	WO-2012000107	A1	1/2012
WO	WO-2012139276	A1	10/2012
WO	WO-2013008251	A2	1/2013
WO	WO-2013027893	A1	2/2013
WO	WO-2013152454	A1	10/2013
WO	WO-2013166588	A1	11/2013
WO	WO-2014031899	A1	2/2014
WO	WO-2014194262	A2	12/2014
WO	WO-2014194439	A1	12/2014
WO	WO-2015192026	A1	12/2015
WO	WO-2016054562	A1	4/2016
WO	WO-2016065131	A1	4/2016
WO	WO-2016090605	A1	6/2016
WO	WO-2016/112299	A1	7/2016
WO	WO-2016179166	A1	11/2016
WO	WO-2016179235	A1	11/2016
WO	WO-2017176739	A1	10/2017
WO	WO-2017176992	A1	10/2017
WO	WO-2018005644	A1	1/2018
WO	WO-2018081013	A1	5/2018
WO	WO-2018102562	A1	6/2018
WO	WO-2018129531	A1	7/2018
WO	WO-2019089613	A1	5/2019
WO	WO-2022212148	A1	10/2022
WO	WO-2022213033	A1	10/2022

OTHER PUBLICATIONS

"U.S. Appl. No. 17/396,983, Examiner Interview Summary mailed Jul. 10, 2024", 2 pgs.
"U.S. Appl. No. 17/396,983, Response filed Jul. 19, 2024 to Final Office Action mailed Apr. 19, 2024", 11 pgs.
"U.S. Appl. No. 17/396,983, Notice of Allowance mailed Aug. 14, 2024", 10 pgs.
U.S. Appl. No. 17/396,983, filed Aug. 9, 2021, User Presence Status Indicators Generation and Management.
U.S. Appl. No. 17/397,366, filed Aug. 9, 2021, User Presence Indication Data Management.
"U.S. Appl. No. 17/396,983, Examiner Interview Summary mailed Feb. 9, 2023", 2 pgs.
"U.S. Appl. No. 17/396,983, Examiner Interview Summary mailed Mar. 26, 2024", 2 pgs.
"U.S. Appl. No. 17/396,983, Final Office Action mailed Apr. 19, 2024", 24 pgs.
"U.S. Appl. No. 17/396,983, Final Office Action mailed Aug. 16, 2023", 20 pgs.
"U.S. Appl. No. 17/396,983, Final Office Action mailed Oct. 26, 2022", 18 pgs.
"U.S. Appl. No. 17/396,983, Non Final Office Action mailed Mar. 8, 2023", 19 pgs.
"U.S. Appl. No. 17/396,983, Non Final Office Action mailed Jul. 6, 2022", 15 pgs.
"U.S. Appl. No. 17/396,983, Non Final Office Action mailed Dec. 27, 2023", 21 pgs.
"U.S. Appl. No. 17/396,983, Response filed Feb. 23, 2023 to Final Office Action mailed Oct. 26, 2022", 12 pgs.
"U.S. Appl. No. 17/396,983, Response filed Mar. 27, 2024 to Non Final Office Action mailed Dec. 27, 2023", 11 pgs.
"U.S. Appl. No. 17/396,983, Response filed Jul. 10, 2023 to Non Final Office Action mailed Mar. 8, 2023", 10 pgs.
"U.S. Appl. No. 17/396,983, Response filed Oct. 6, 2022 to Non Final Office Action mailed Jul. 6, 2022", 11 pgs.
"U.S. Appl. No. 17/396,983, Response filed Dec. 18, 2023 to Final Office Action mailed Aug. 16, 2023", 11 pgs.
"U.S. Appl. No. 17/397,366, Examiner Interview Summary mailed Feb. 7, 2024", 2 pgs.
"U.S. Appl. No. 17/397,366, Final Office Action mailed Oct. 27, 2023", 16 pgs.
"U.S. Appl. No. 17/397,366, Final Office Action mailed Nov. 10, 2022", 14 pgs.
"U.S. Appl. No. 17/397,366, Non Final Office Action mailed May 10, 2022", 14 pgs.
"U.S. Appl. No. 17/397,366, Non Final Office Action mailed Jun. 8, 2023", 13 pgs.
"U.S. Appl. No. 17/397,366, Notice of Allowance mailed Feb. 29, 2024", 7 pgs.
"U.S. Appl. No. 17/397,366, Response filed Feb. 7, 2024 to Final Office Action mailed Oct. 27, 2023", 11 pgs.
"U.S. Appl. No. 17/397,366, Response filed Aug. 10, 2022 to Non Final Office Action mailed May 10, 2022", 10 pgs.
"U.S. Appl. No. 17/397,366, Response filed Oct. 10, 2023 to Non Final Office Action mailed Jun. 8, 2023", 9 pgs.
"U.S. Appl. No. 17/397,366, Response Filed Feb. 10, 2023 to Final Office Action Mailed Nov. 10, 2022", 10 pgs.
"International Application Serial No. PCT/US2022/021565, International Preliminary Report on Patentability mailed Oct. 12, 2023", 7 pgs.
"International Application Serial No. PCT/US2022/021565, International Search Report mailed Jun. 28, 2022", 4 pgs.
"International Application Serial No. PCT/US2022/021565, Written Opinion mailed Jun. 28, 2022", 6 pgs.

(56) **References Cited**

OTHER PUBLICATIONS

"International Application Serial No. PCT/US2022/071315, International Preliminary Report on Patentability mailed Oct. 12, 2023", 7 pgs.

"International Application Serial No. PCT/US2022/071315, International Search Report mailed Jul. 12, 2022", 4 pgs.

"International Application Serial No. PCT/US2022/071315, Written Opinion mailed Jul. 12, 2022", 5 pgs.

Castelluccia, Claude, et al., "EphPub: Toward robust Ephemeral Publishing", 19th IEEE International Conference on Network Protocols (ICNP), (Oct. 17, 2011), 18 pgs.

Fajman, "An Extensible Message Format for Message Disposition Notifications", Request for Comments: 2298, National Institutes of Health, (Mar. 1998), 28 pgs.

Leyden, John, "This SMS will self-destruct in 40 seconds", [Online] Retrieved from the Internet: <URL: http://www.theregister.co.uk/2005/12/12/stealthtext/>, (Dec. 12, 2005), 1 pg.

Melanson, Mike, "This text message will self destruct in 60 seconds", [Online] Retrieved from the Internet: <URL: http://readwrite.com/2011/02/11/this_text_message_will_self_destruct_in_60_seconds>, (Feb. 18, 2015), 4 pgs.

Sawers, Paul, "Snapchat for iOS Lets You Send Photos to Friends and Set How long They're Visible For", [Online] Retrieved from the Internet: <URL: https://thenextweb.com/news/snapchat-for-ios-lets-you-send-photos-to-friends-and-set-how-long-theyre-visible-for>, (May 7, 2012), 5 pgs.

Shein, Esther, "Ephemeral Data", Communications of the ACM, vol. 56, No. 9, (Sep. 2013), 3 pgs.

Vaas, Lisa, "Stealth Text, Should You Choose to Accept It", [Online] Retrieved from the Internet: <URL: https://www.eweek.com/enterprise-apps/stealthtext-should-you-choose-to-accept-it/>, (Dec. 13, 2005), 3 pgs.

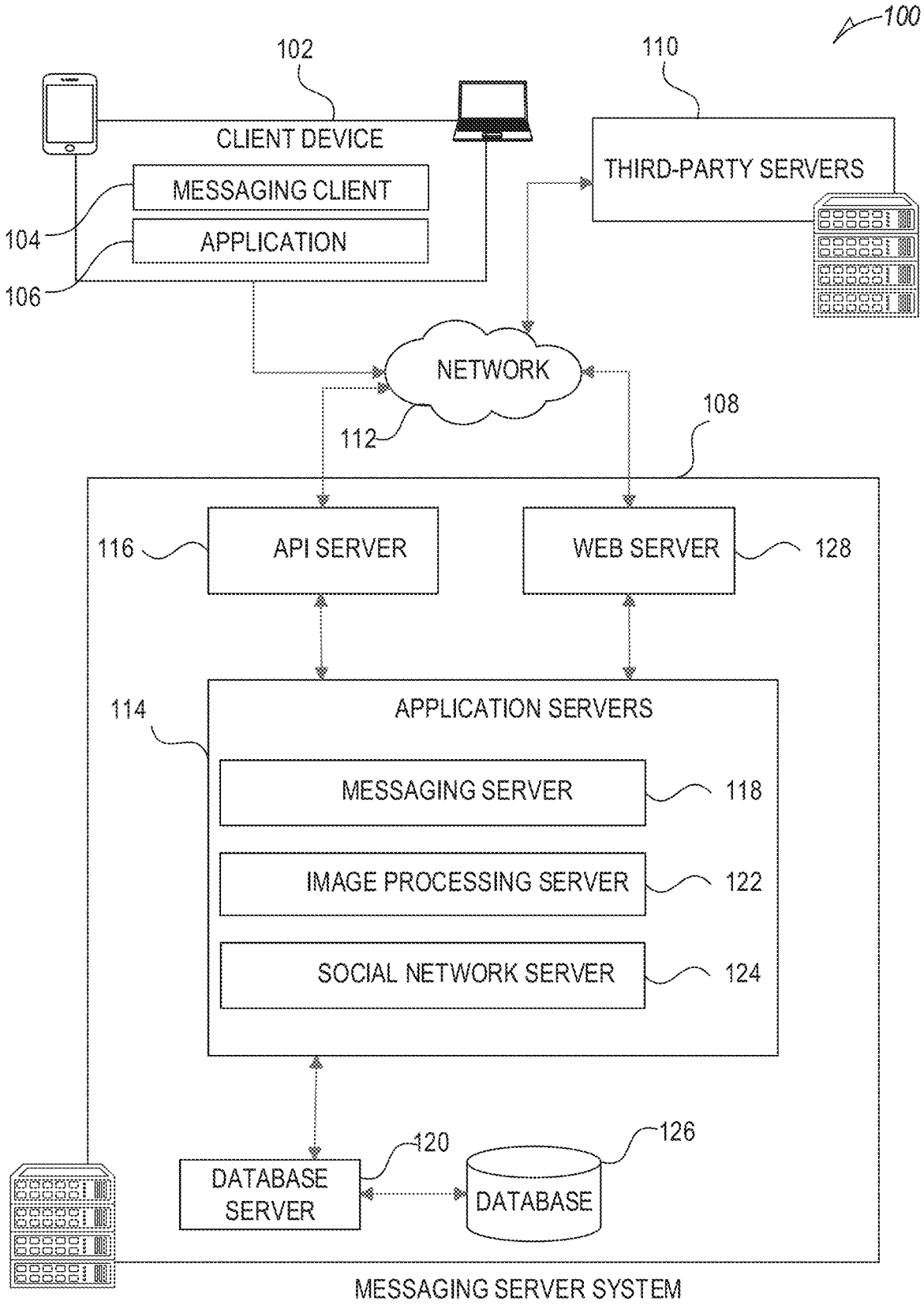

100
102
CLIENT DEVICE
MESSAGING CLIENT
104
APPLICATION
106
110
THIRD-PARTY SERVERS
NETWORK
112
108
116
API SERVER
WEB SERVER
128
114
APPLICATION SERVERS
MESSAGING SERVER
118
IMAGE PROCESSING SERVER
122
SOCIAL NETWORK SERVER
124
120
DATABASE SERVER
126
DATABASE
MESSAGING SERVER SYSTEM

FIG. 1

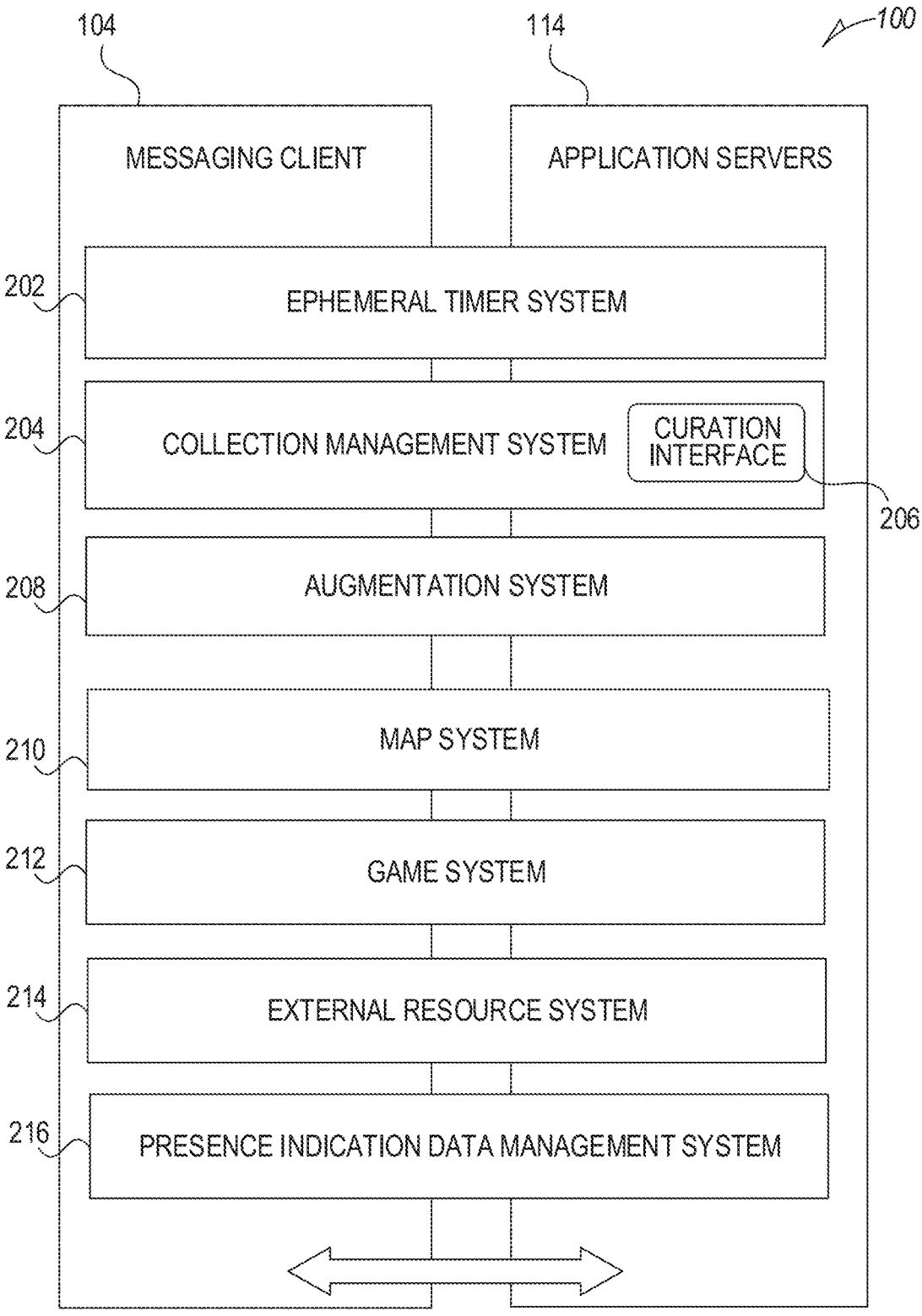

104
114
100
MESSAGING CLIENT
APPLICATION SERVERS
202
EPHEMERAL TIMER SYSTEM
204
COLLECTION MANAGEMENT SYSTEM
CURATION INTERFACE
206
208
AUGMENTATION SYSTEM
210
MAP SYSTEM
212
GAME SYSTEM
214
EXTERNAL RESOURCE SYSTEM
216
PRESENCE INDICATION DATA MANAGEMENT SYSTEM

FIG. 2

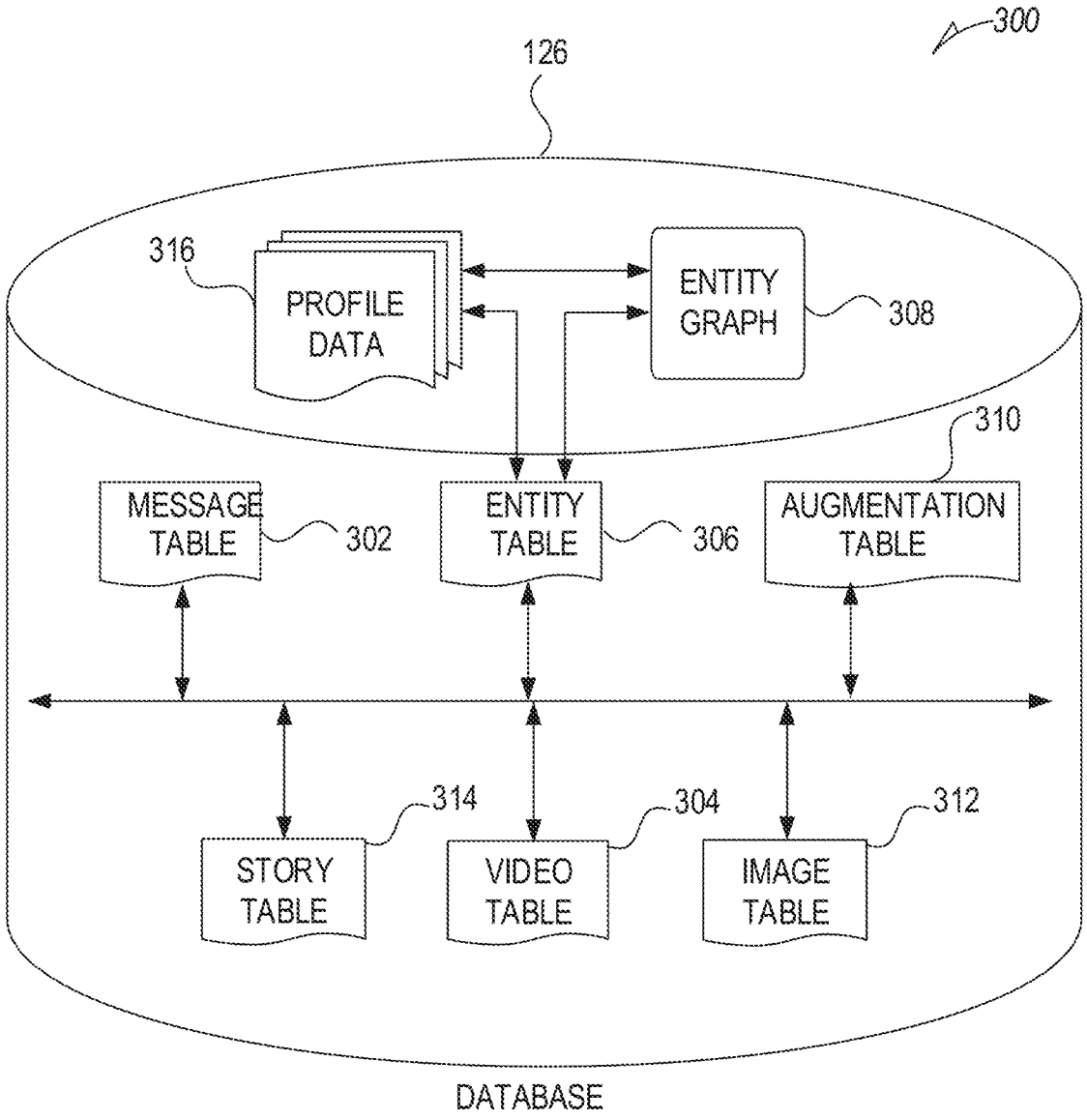

300
126
316
PROFILE DATA
ENTITY GRAPH
308
310
MESSAGE TABLE
302
ENTITY TABLE
306
AUGMENTATION TABLE
314
304
312
STORY TABLE
VIDEO TABLE
IMAGE TABLE
DATABASE

FIG. 3

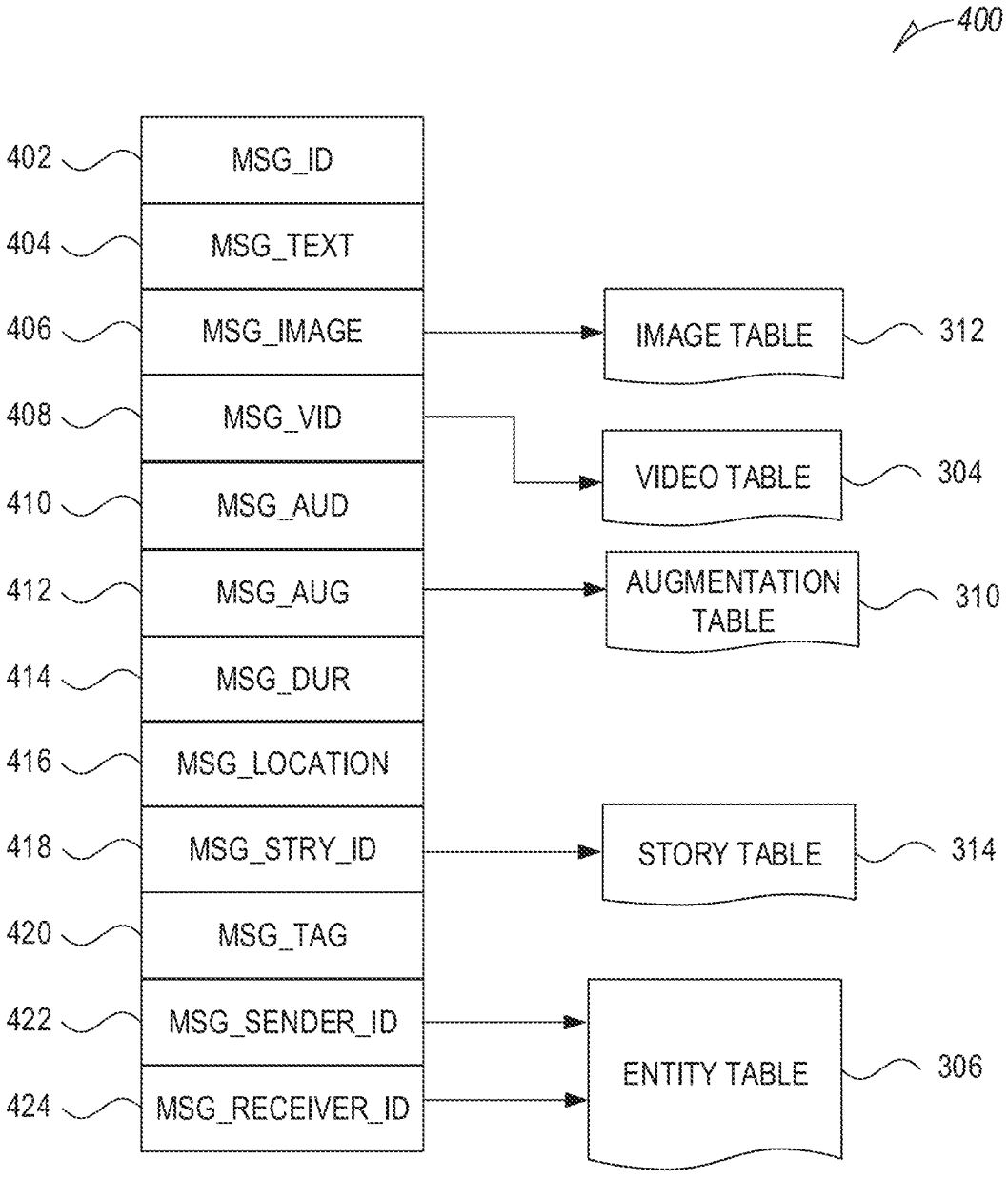

400
402
MSG_ID
404
MSG_TEXT
406
MSG_IMAGE
IMAGE TABLE
312
408
MSG_VID
VIDEO TABLE
304
410
MSG_AUD
412
MSG_AUG
AUGMENTATION TABLE
310
414
MSG_DUR
416
MSG_LOCATION
418
MSG_STRY_ID
STORY TABLE
314
420
MSG_TAG
422
MSG_SENDER_ID
424
MSG_RECEIVER_ID
ENTITY TABLE
306

FIG. 4

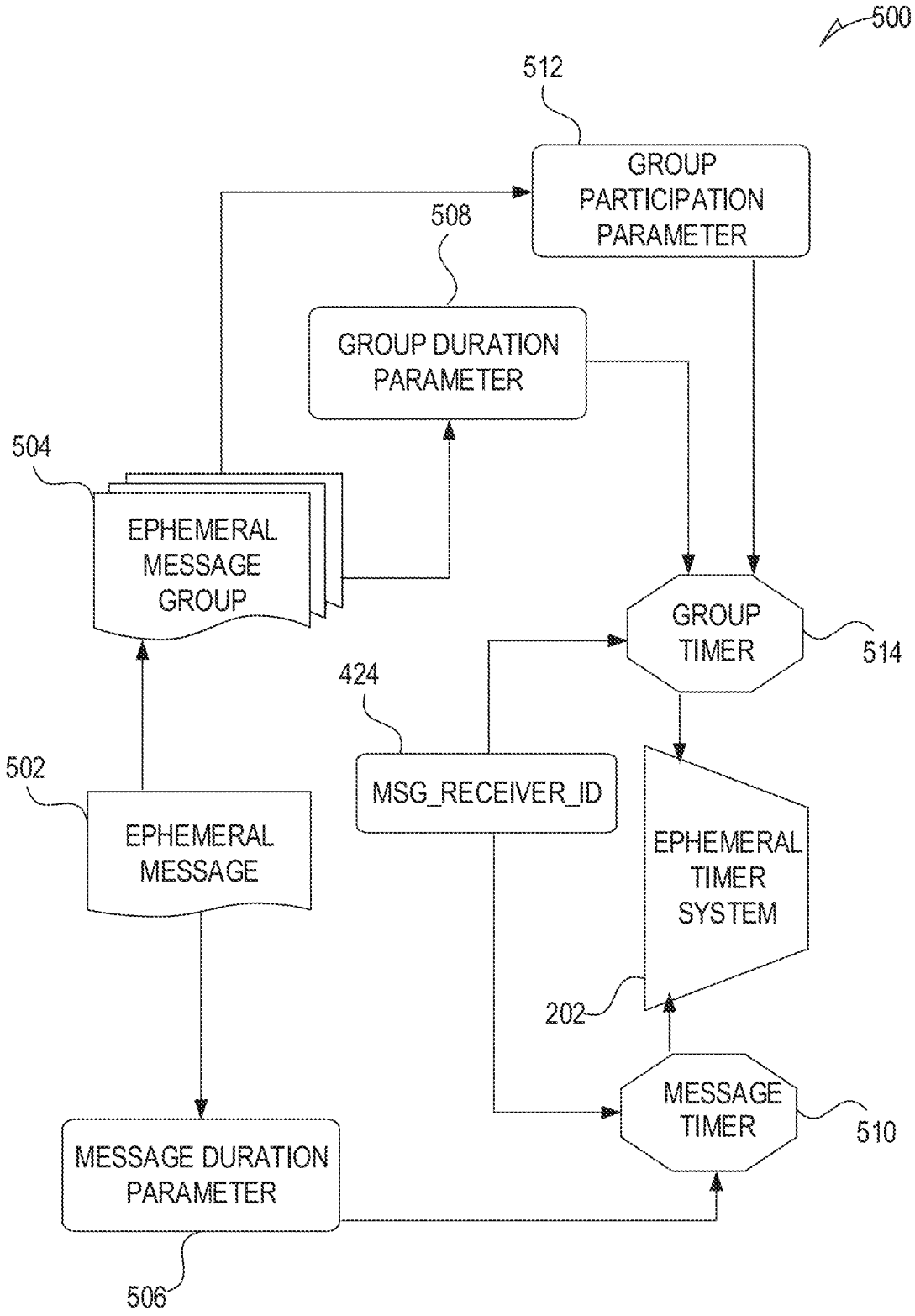

500
512
GROUP PARTICIPATION PARAMETER
508
GROUP DURATION PARAMETER
504
EPHEMERAL MESSAGE GROUP
GROUP TIMER
514
424
MSG_RECEIVER_ID
502
EPHEMERAL MESSAGE
EPHEMERAL TIMER SYSTEM
202
MESSAGE TIMER
510
MESSAGE DURATION PARAMETER
506

FIG. 5

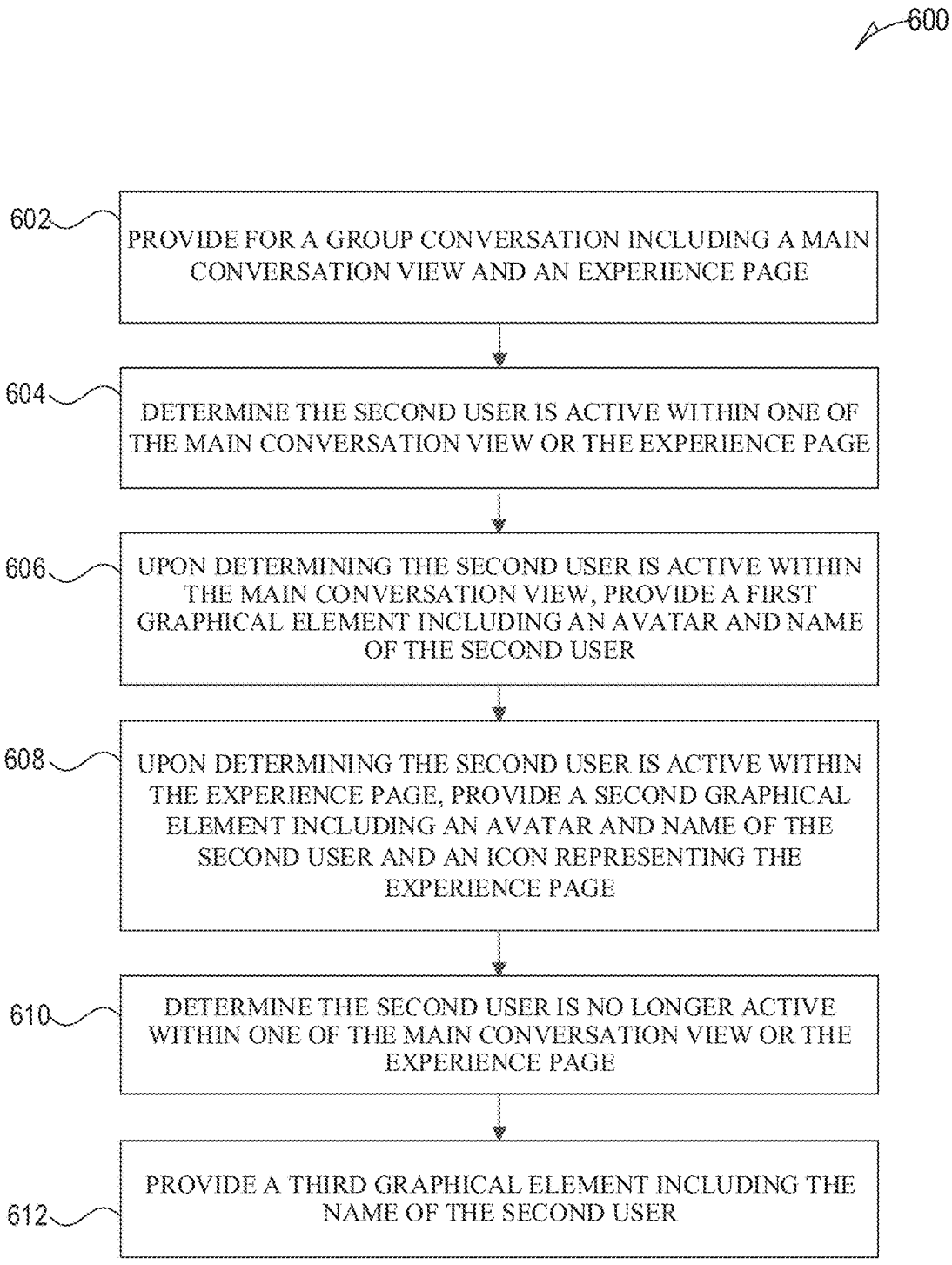

600
602
PROVIDE FOR A GROUP CONVERSATION INCLUDING A MAIN CONVERSATION VIEW AND AN EXPERIENCE PAGE
604
DETERMINE THE SECOND USER IS ACTIVE WITHIN ONE OF THE MAIN CONVERSATION VIEW OR THE EXPERIENCE PAGE
606
UPON DETERMINING THE SECOND USER IS ACTIVE WITHIN THE MAIN CONVERSATION VIEW, PROVIDE A FIRST GRAPHICAL ELEMENT INCLUDING AN AVATAR AND NAME OF THE SECOND USER
608
UPON DETERMINING THE SECOND USER IS ACTIVE WITHIN THE EXPERIENCE PAGE, PROVIDE A SECOND GRAPHICAL ELEMENT INCLUDING AN AVATAR AND NAME OF THE SECOND USER AND AN ICON REPRESENTING THE EXPERIENCE PAGE
610
DETERMINE THE SECOND USER IS NO LONGER ACTIVE WITHIN ONE OF THE MAIN CONVERSATION VIEW OR THE EXPERIENCE PAGE
612
PROVIDE A THIRD GRAPHICAL ELEMENT INCLUDING THE NAME OF THE SECOND USER

FIG. 6

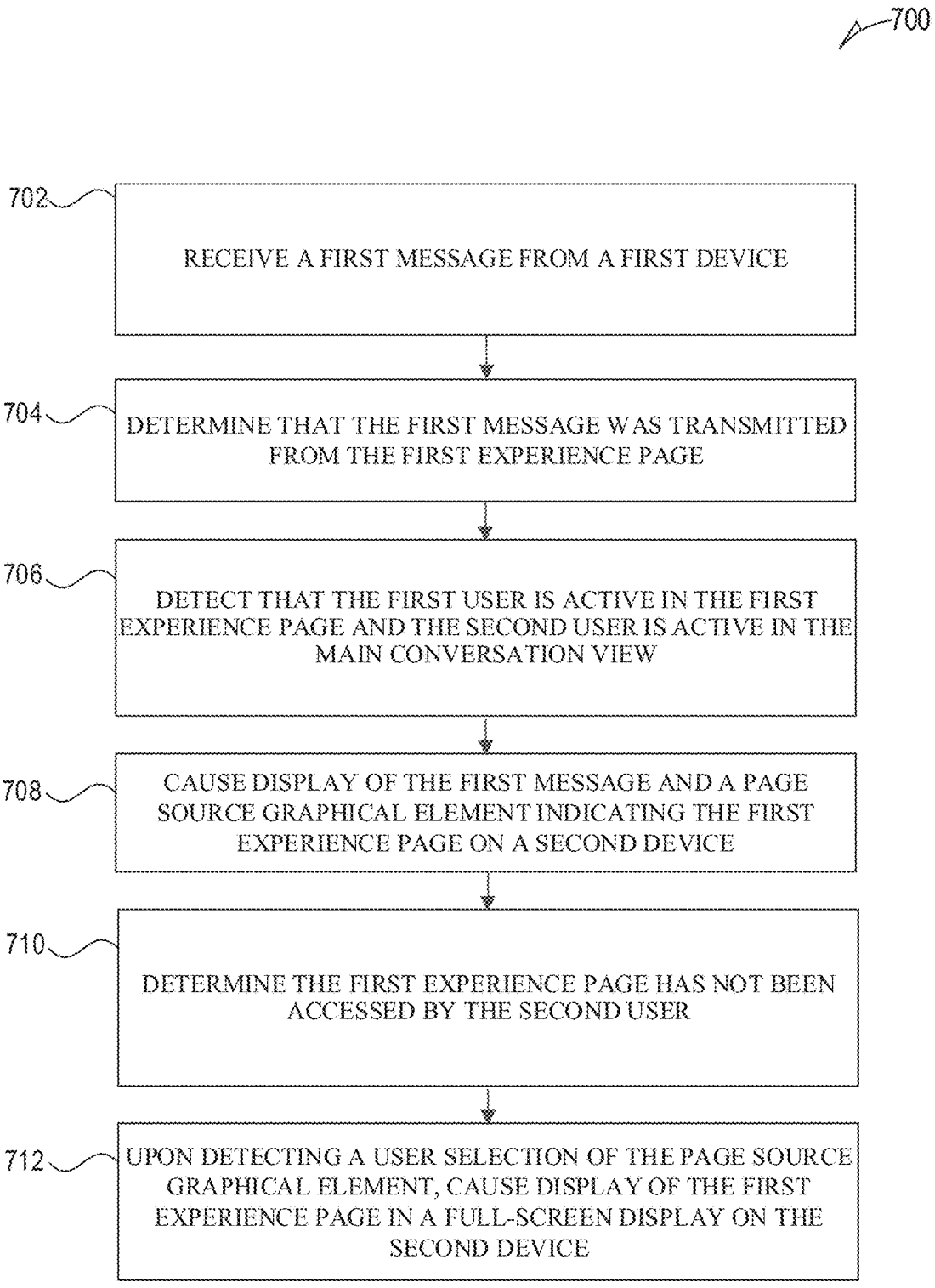

700
702
RECEIVE A FIRST MESSAGE FROM A FIRST DEVICE
704
DETERMINE THAT THE FIRST MESSAGE WAS TRANSMITTED FROM THE FIRST EXPERIENCE PAGE
706
DETECT THAT THE FIRST USER IS ACTIVE IN THE FIRST EXPERIENCE PAGE AND THE SECOND USER IS ACTIVE IN THE MAIN CONVERSATION VIEW
708
CAUSE DISPLAY OF THE FIRST MESSAGE AND A PAGE SOURCE GRAPHICAL ELEMENT INDICATING THE FIRST EXPERIENCE PAGE ON A SECOND DEVICE
710
DETERMINE THE FIRST EXPERIENCE PAGE HAS NOT BEEN ACCESSED BY THE SECOND USER
712
UPON DETECTING A USER SELECTION OF THE PAGE SOURCE GRAPHICAL ELEMENT, CAUSE DISPLAY OF THE FIRST EXPERIENCE PAGE IN A FULL-SCREEN DISPLAY ON THE SECOND DEVICE

FIG. 7

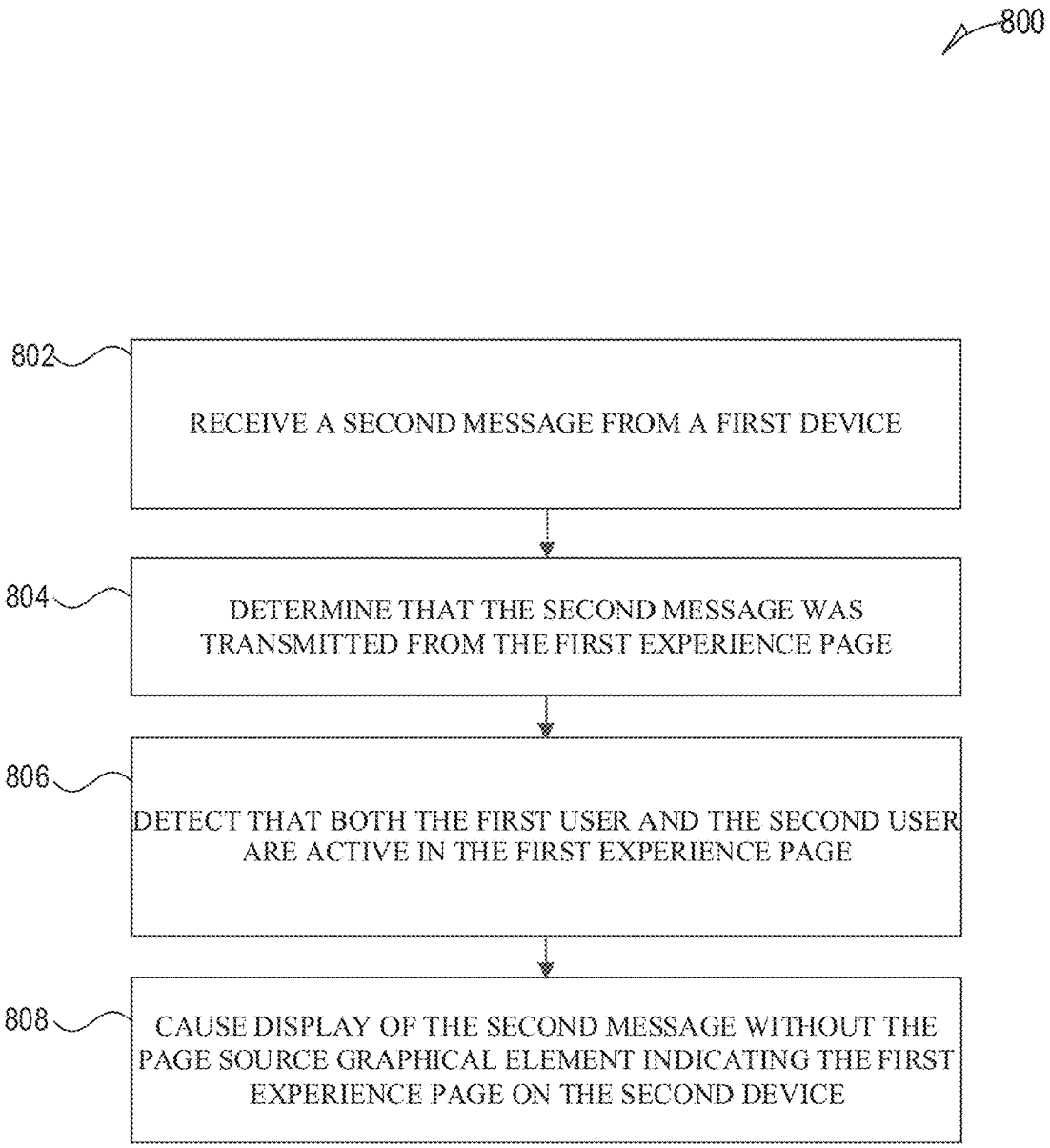

800
802
RECEIVE A SECOND MESSAGE FROM A FIRST DEVICE
804
DETERMINE THAT THE SECOND MESSAGE WAS TRANSMITTED FROM THE FIRST EXPERIENCE PAGE
806
DETECT THAT BOTH THE FIRST USER AND THE SECOND USER ARE ACTIVE IN THE FIRST EXPERIENCE PAGE
808
CAUSE DISPLAY OF THE SECOND MESSAGE WITHOUT THE PAGE SOURCE GRAPHICAL ELEMENT INDICATING THE FIRST EXPERIENCE PAGE ON THE SECOND DEVICE

FIG. 8

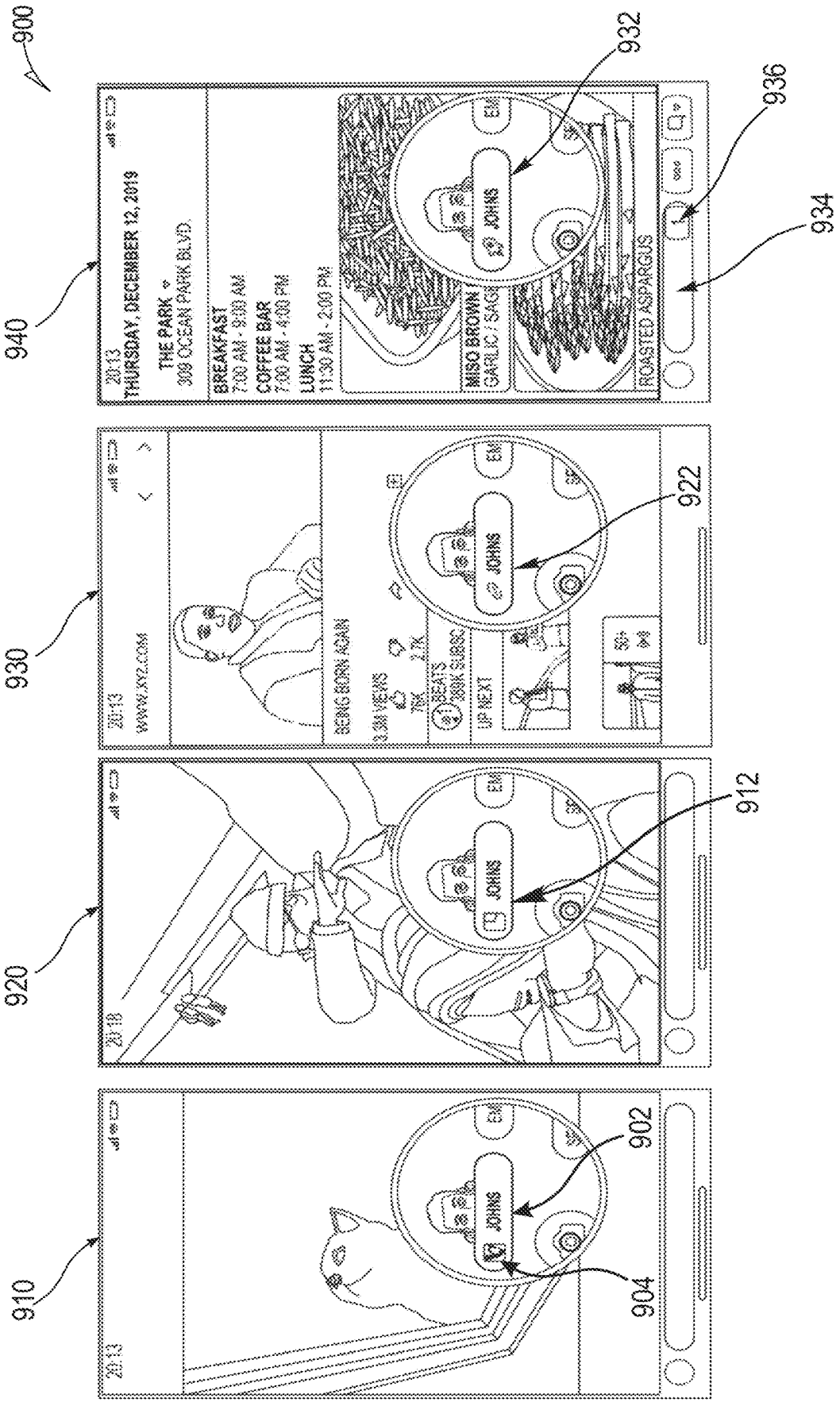

900
910
920
930
940
902
904
912
922
932
934
936
JOHNS
BEING BORN AGAIN
THE PARK
309 OCEAN PARK BLVD
BREAKFAST
7:00 AM - 9:00 AM
COFFEE BAR
7:00 AM - 4:00 PM
LUNCH
11:30 AM - 2:00 PM
MISO BROWN
GARLIC / SAGE
ROASTED ASPARGUS
THURSDAY, DECEMBER 12, 2019

FIG. 9

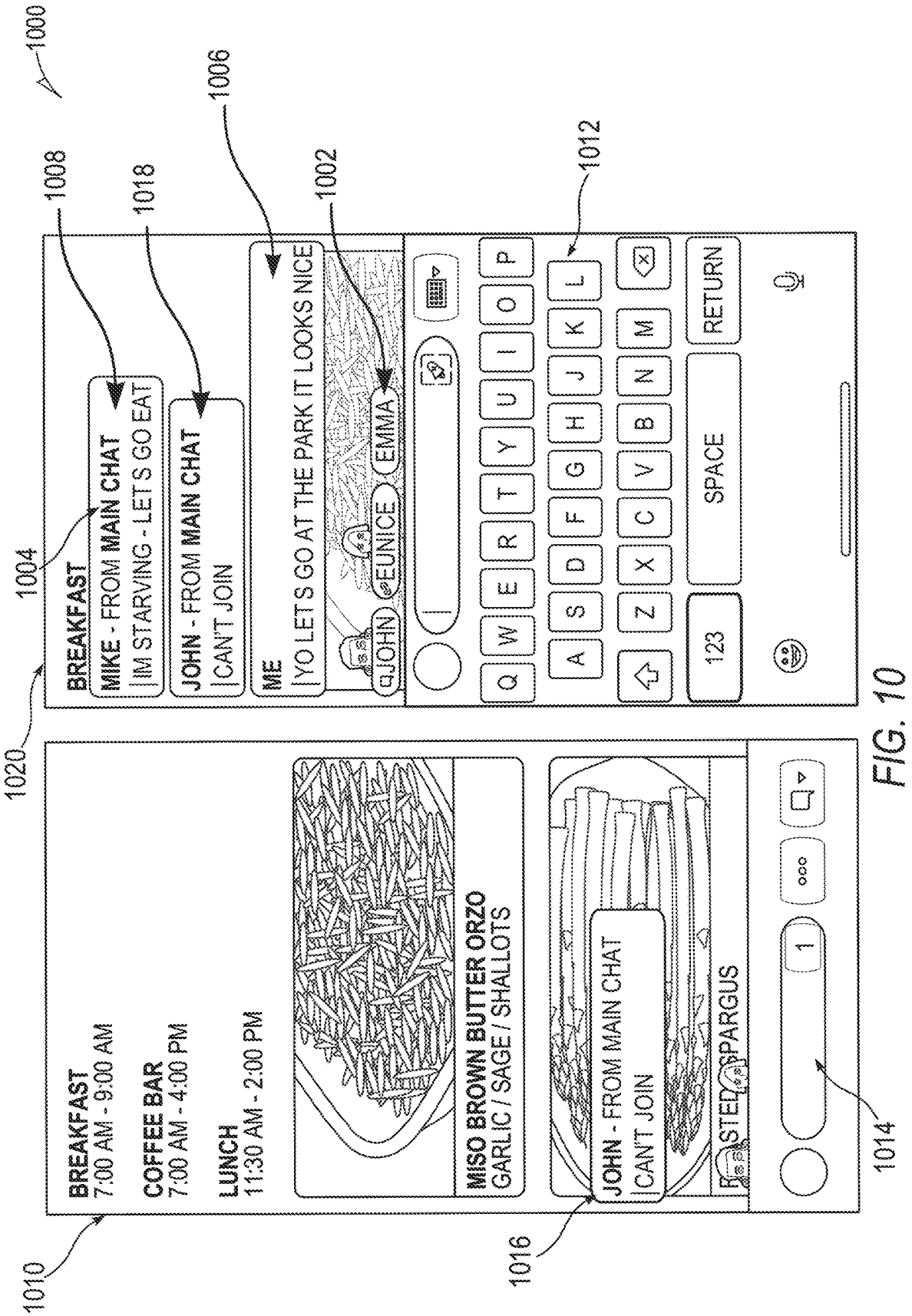

1000
1002
1004
1006
1008
1010
1012
1014
1016
1018
1020
BREAKFAST
MIKE - FROM MAIN CHAT
IM STARVING - LETS GO EAT
JOHN - FROM MAIN CHAT
CAN'T JOIN
ME
YO LETS GO AT THE PARK IT LOOKS NICE
JOHN
EUNICE
EMMA
BREAKFAST
7:00 AM - 9:00 AM
COFFEE BAR
7:00 AM - 4:00 PM
LUNCH
11:30 AM - 2:00 PM
MISO BROWN BUTTER ORZO
GARLIC / SAGE / SHALLOTS
JOHN - FROM MAIN CHAT
CAN'T JOIN
ROASTED ASPARGUS
SPACE
RETURN
123

FIG. 10

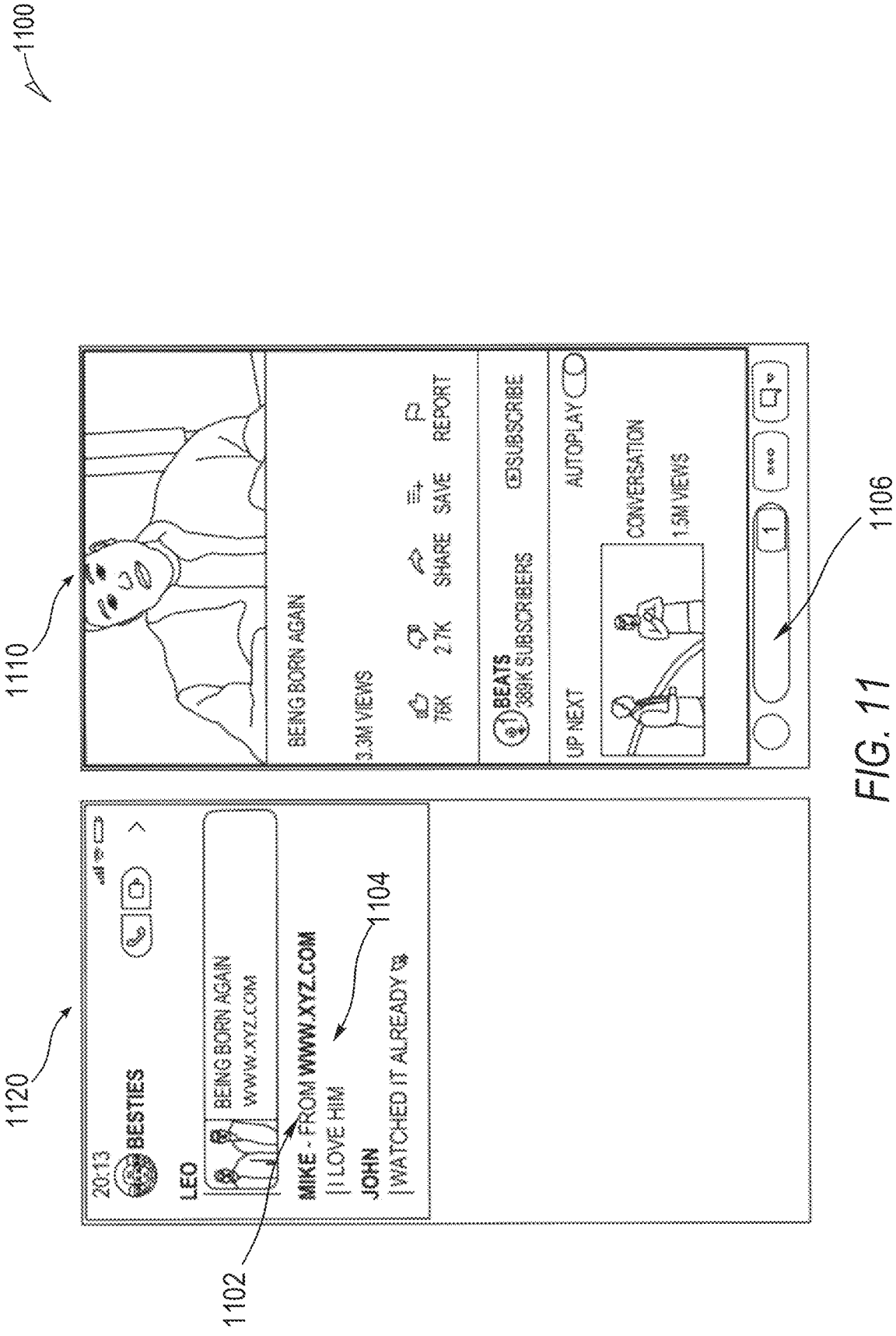

1100
1110
1120
1102
1104
1106
BEING BORN AGAIN
3.3M VIEWS
78K
2.7K
SHARE
SAVE
REPORT
BEATS
380K SUBSCRIBERS
SUBSCRIBE
UP NEXT
AUTOPLAY
CONVERSATION
1.5M VIEWS
20:13
BESTIES
LEO
BEING BORN AGAIN
WWW.XYZ.COM
MIKE - FROM WWW.XYZ.COM
I LOVE HIM!
JOHN
I WATCHED IT ALREADY

FIG. 11

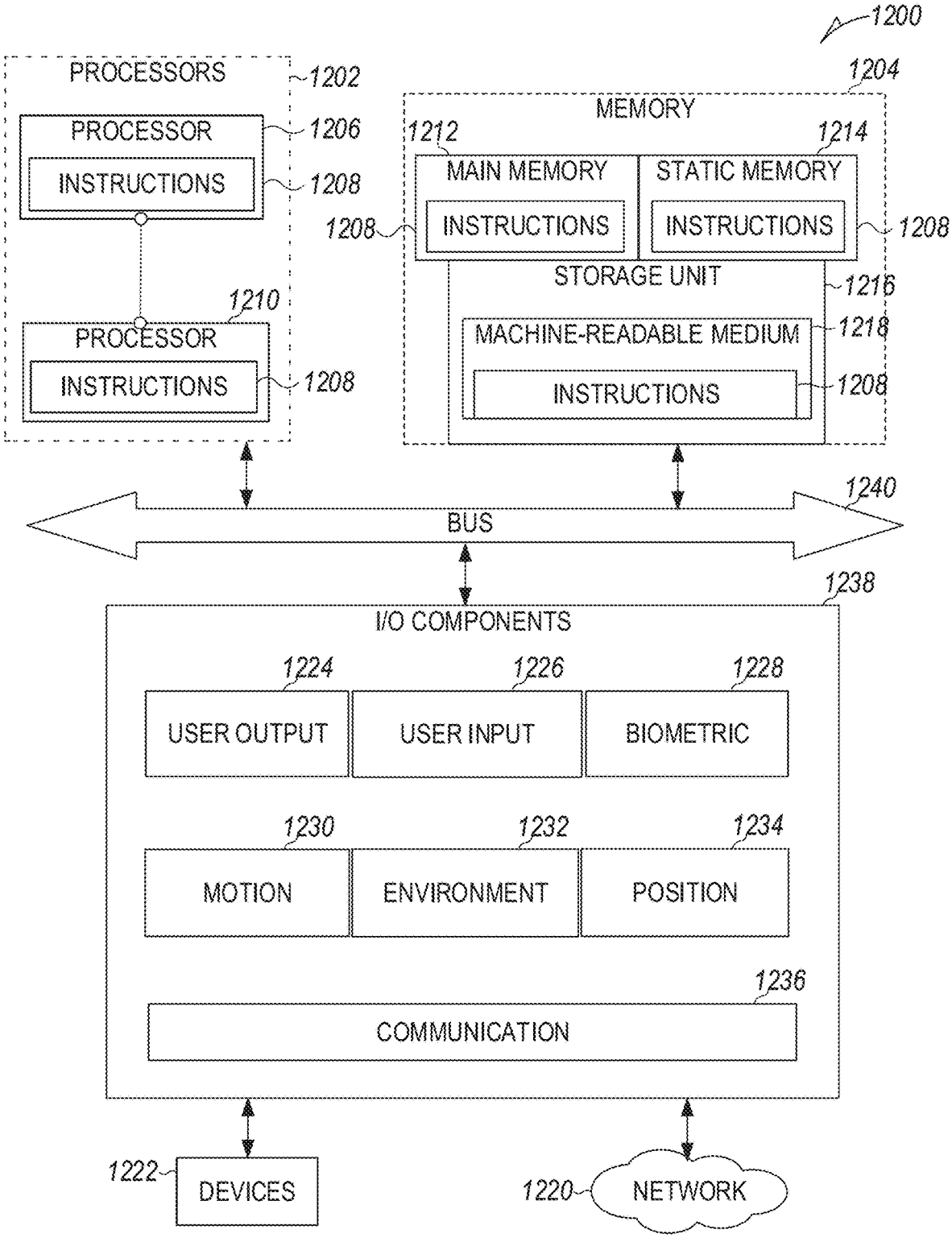

1200
PROCESSORS
1202
PROCESSOR
1206
INSTRUCTIONS
1208
1210
PROCESSOR
INSTRUCTIONS
1208
1204
MEMORY
1212
1214
MAIN MEMORY
STATIC MEMORY
1208
INSTRUCTIONS
INSTRUCTIONS
1208
STORAGE UNIT
1216
MACHINE-READABLE MEDIUM
1218
INSTRUCTIONS
1208
1240
BUS
1238
I/O COMPONENTS
1224
1226
1228
USER OUTPUT
USER INPUT
BIOMETRIC
1230
1232
1234
MOTION
ENVIRONMENT
POSITION
1236
COMMUNICATION
1222
DEVICES
1220
NETWORK

FIG. 12

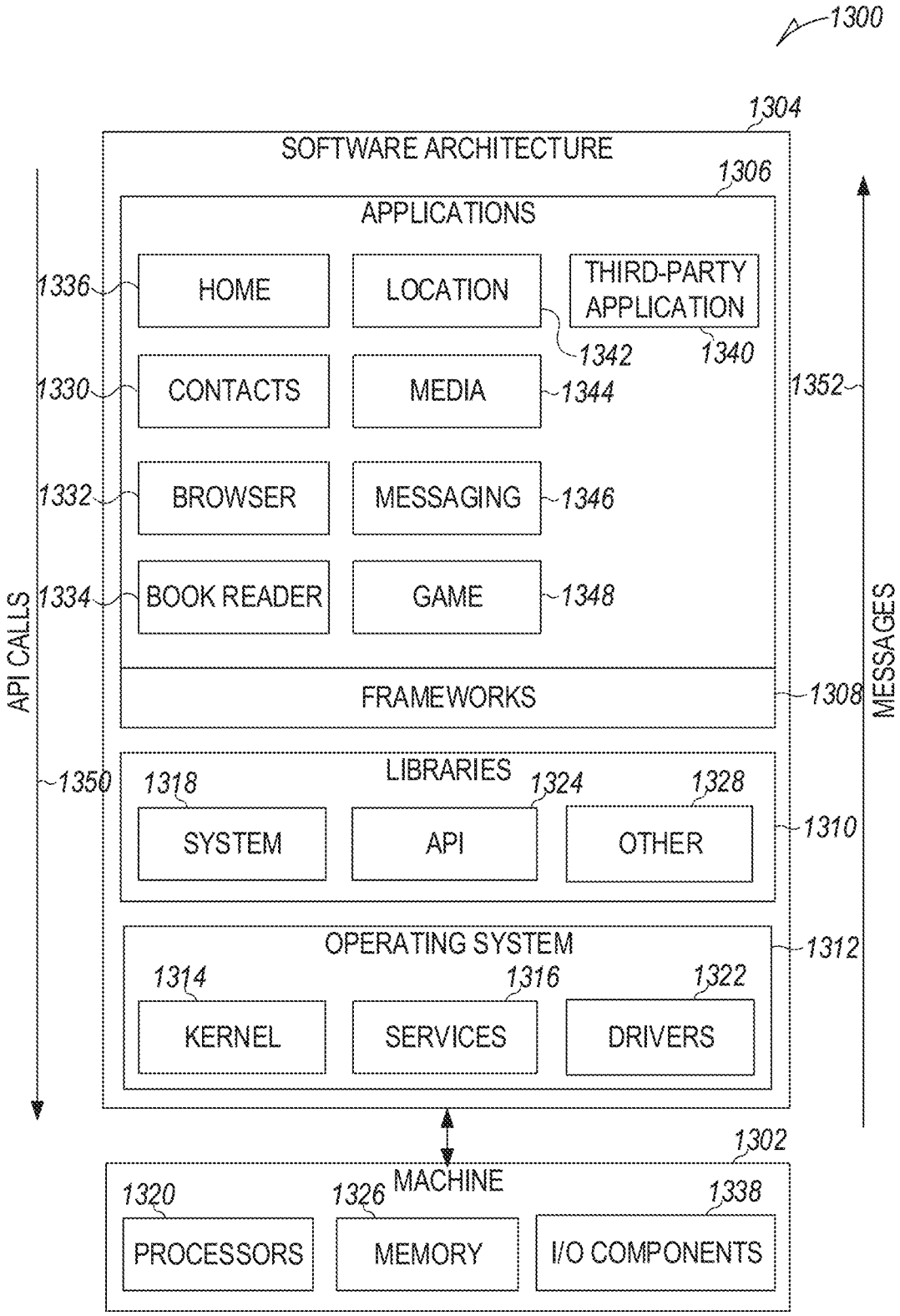

1300
1304
SOFTWARE ARCHITECTURE
1306
APPLICATIONS
1336
HOME
LOCATION
THIRD-PARTY APPLICATION
1342
1340
1330
CONTACTS
MEDIA
1344
1352
1332
BROWSER
MESSAGING
1346
1334
BOOK READER
GAME
1348
API CALLS
MESSAGES
FRAMEWORKS
1308
1350
LIBRARIES
1318
1324
1328
SYSTEM
API
OTHER
1310
OPERATING SYSTEM
1312
1314
1316
1322
KERNEL
SERVICES
DRIVERS
1302
MACHINE
1320
1326
1338
PROCESSORS
MEMORY
I/O COMPONENTS

FIG. 13

USER PRESENCE INDICATION DATA MANAGEMENT

CLAIM OF PRIORITY

This application is a continuation of U.S. patent application Ser. No. 17/397,366, filed Aug. 9, 2021, which claims the benefit of priority to U.S. Provisional Application Ser. No. 63/168,514, filed Mar. 31, 2021, each of which is incorporated herein by reference in its entirety.

BACKGROUND

Electronic messaging, particularly instant messaging, continues to grow globally in popularity. Users are quickly able to instantly share electronic media content items, including text, electronic images, audio, and video.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

In the drawings, which are not necessarily drawn to scale, like numerals may describe similar components in different views. To easily identify the discussion of any particular element or act, the most significant digit or digits in a reference number refer to the figure number in which that element is first introduced. Some embodiments are illustrated by way of example, and not limitation, in the figures of the accompanying drawings in which:

FIG. **1** is a diagrammatic representation of a networked environment in which the present disclosure may be deployed, in accordance with some examples.

FIG. **2** is a diagrammatic representation of a messaging system, in accordance with some examples, that has both client-side and server-side functionality.

FIG. **3** is a diagrammatic representation of a data structure as maintained in a database, in accordance with some examples.

FIG. **4** is a diagrammatic representation of a message, in accordance with some examples.

FIG. **5** is a flowchart for an access-limiting process, in accordance with some examples.

FIG. **6** illustrates a process of providing presence indicators of users in a conversation, in accordance with one embodiment.

FIG. **7** illustrates a process of providing page source indicators based on user presence status, in accordance with one embodiment.

FIG. **8** illustrates a process of withholding page source indicators based on user presence status, in accordance with one embodiment.

FIG. **9** illustrates user interfaces related to presence indicators displayed on a client device, in accordance with one embodiment.

FIG. **10** illustrates user interfaces related to presence indicators and page source indicators displayed on a client device, in accordance with one embodiment.

FIG. **11** illustrates user interfaces related to page source indicators displayed on a client device, in accordance with one embodiment.

FIG. **12** is a diagrammatic representation of a machine in the form of a computer system within which a set of instructions may be executed for causing the machine to perform any one or more of the methodologies discussed herein, in accordance with some examples.

FIG. **13** is a block diagram showing a software architecture within which examples may be implemented.

DETAILED DESCRIPTION

In messaging systems, users are connected to various other users with different levels and types of relationships. With the increasing number of users on social networking systems, each user also has a growing network of individuals she follows. Therefore, to maintain user engagement on social networking systems, it is important that the systems have the ability to integrate user presence indications to provide a more interactive and synchronized engagement environment when the users exchange media content items with one another.

A messaging system may implement or otherwise work in conjunction with a social networking system. As such, the existing social networking systems are presented with the challenges of creating a perception of an absence of a user in the system while the user engages in activities with other users in a shared full-screen experience page accessible from a group or a private conversation. For example, a group or a private conversation provided by a messaging application may include a main conversation view from which other experiences (e.g., media content, web links, games, and the like) can be launched in a full-screen mode. When a conversation (e.g., message thread) includes multiple users, it may be difficult to detect which users are present in (e.g., viewing) the conversation, and if so, which user interface they are present in.

Embodiments of the present disclosure improve the functionality of electronic messaging software and systems by providing users a highly interactive and engaging communication environment and a seamless communication experience. Specifically, the messaging system may allow users to continue the communication in various types of full-screen experience pages accessible from the main conversation view of a group chat or a private chat. Depending on the user interface with which a user currently interacts, the messaging system may also generate and display other group users' presence indicators on the user interface. The presence indicators, such as icons (e.g., graphical elements) described further in detail below, reflect other group users' presence status and the types of experience pages currently accessed by the group users. An experience page may be a full-screen display of an activated media content item, such as an image, a video, audio, or a link. An experience page may also be a full-screen display of an activated mini-program, a game, a video or audio call with other users, or content available to the users in the messaging system.

In some embodiments, the messaging system provides for a group conversation between a plurality of users, including a first user and a second user. The group conversation includes the main conversation view and a plurality of experience pages accessible from the main conversation view. In some embodiments, the messaging system determines that the second user is active within one of the main conversation view or the experience page. Upon determining that the second user is active within the main conversation view, the messaging system provides a first graphical element for display on a first device associated with the first user. The first graphical element includes an avatar and the name of the second user. Upon determining that the second user is active within an experience page, the messaging system provides a second graphical element for display on the first device. The second graphical element includes the avatar and name of the second user and an icon representing

the type of the experience page. For example, if the experience page is an image, the icon may be a silhouette symbol, such as a smaller version (e.g., element **904**), of the image.

In some embodiments, upon determining the second user is no longer active within one of the main conversation view or the experience page, the messaging system provides a third graphical element that only includes the second user's name. In some embodiments, the first and second graphical elements may be associated with vivid colors, enhancing the representation of the user's "present" or "online" status, while the third graphical element may be associated with muted colors, such as a semi-transparent grey color, representing an "absence" or "offline" status of the user.

In some embodiments, each experience page includes an expandable text input bar and a fourth graphical element that is expandable to display a list of chronologically ordered messages (e.g., message thread) sent by the plural users from the main conversation view and each of the experience pages. Therefore, regardless of whether a user is present in the main conversation view or any one of the experience pages, the user can view all incoming messages and reply to those messages from the current page.

In some embodiments, when the messaging system receives a message from a first user, the system determines if the first user and user of the device (e.g., the second user) are active within the same page. If they are not active within the same page, the messaging system may display the message in conjunction with a selectable page source graphical element (e.g., page source indicator) on the user interface of the second user. The page source graphical element includes an indication of the page currently viewed by the first user. For example, if the first user sent the message from a full-screen display of a weblink "xyz.com," the third graphical element may include a selectable text display showing "from xyz.com" as the page source indicator, in conjunction with the display of the message and the name of the first user.

In some embodiments, if the messaging system determines that both the first and the second users are active within the same page (e.g., "xyz.com"), the messaging system may withhold the display of page source indicator "from xyz.com" and only display the name of the first user and the content of the message.

The improved messaging system allows users to maintain communication flow by incorporating the text input bar in each of the experience pages and displaying the full message thread in the group conversation. It allows users to spend time on experience pages while engaging in conversation with others without worrying about rushing back to the main conversation view only to check and respond to unread messages. In addition, the presence indicators allow users to view others' presence status and the types of full-screen experience page that other users are currently accessing. This way, users may stay informed of others' presence status in the conversation, and the types of content they are currently accessing. Further, the improved messaging system allows users to view the page source of a particular message being sent, so that the users may choose to access the experience page to engage in further communication with the sender of the message. The improved messaging system increases the number of exchanged media content items between users and the time the users choose to spend with the messaging system.

Networked Computing Environment

FIG. **1** is a block diagram showing an example messaging system **100** for exchanging data (e.g., messages and associated content) over a network. The messaging system **100** includes multiple instances of a client device **102**, each of which hosts a number of applications, including a messaging client **104** and other applications **106**. Each messaging client **104** is communicatively coupled to other instances of the messaging client **104** (e.g., hosted on respective other client devices **102**), a messaging server system **108**, and third-party servers **110** via a network **112** (e.g., the Internet). A messaging client **104** can also communicate with locally-hosted applications **106** using Applications Program Interfaces (APIs).

A messaging client **104** is able to communicate and exchange data with other messaging clients **104** and with the messaging server system **108** via the network **112**. The data exchanged between messaging clients **104**, and between a messaging client **104** and the messaging server system **108**, includes functions (e.g., commands to invoke functions) as well as payload data (e.g., text, audio, video, or other multimedia data).

The messaging server system **108** provides server-side functionality via the network **112** to a particular messaging client **104**. While certain functions of the messaging system **100** are described herein as being performed by either a messaging client **104** or by the messaging server system **108**, the location of certain functionality either within the messaging client **104** or the messaging server system **108** may be a design choice. For example, it may be technically preferable to initially deploy certain technology and functionality within the messaging server system **108** but to later migrate this technology and functionality to the messaging client **104**, where a client device **102** has sufficient processing capacity.

The messaging server system **108** supports various services and operations that are provided to the messaging client **104**. Such operations include transmitting data to, receiving data from, and processing data generated by the messaging client **104**. This data may include message content, client device information, geolocation information, media augmentation and overlays, message content persistence conditions, social network information, and live event information, as examples. Data exchanges within the messaging system **100** are invoked and controlled through functions available via user interfaces of the messaging client **104**.

Turning now specifically to the messaging server system **108**, an API server **116** is coupled to, and provides a programmatic interface to, application servers **114**. The application servers **114** are communicatively coupled to a database server **120**, which facilitates access to a database **126** that stores data associated with messages processed by the application servers **114**. Similarly, a web server **128** is coupled to the application servers **114**, and provides web-based interfaces to the application servers **114**. To this end, the web server **128** processes incoming network requests over the Hypertext Transfer Protocol (HTTP) and several other related protocols.

The API server **116** receives and transmits message data (e.g., commands and message payloads) between the client device **102** and the application servers **114**. Specifically, the API server **116** provides a set of interfaces (e.g., routines and protocols) that can be called or queried by the messaging client **104** in order to invoke the functionality of the application servers **114**. The API server **116** exposes various functions supported by the application servers **114**, including account registration; login functionality; the sending of messages, via the application servers **114**, from a particular messaging client **104** to another messaging client **104**; the sending of media files (e.g., images or video) from a

messaging client **104** to a messaging server **118**, and for possible access by another messaging client **104**; the settings of a collection of media data (e.g., story); the retrieval of a list of friends of a user of a client device **102**; the retrieval of such collections; the retrieval of messages and content; the addition and deletion of entities (e.g., friends) to an entity graph (e.g., a social graph); the location of friends within a social graph; and opening an application event (e.g., relating to the messaging client **104**).

The application servers **114** host a number of server applications and subsystems, including a messaging server **118**, an image processing server **122**, and a social network server **124**. The messaging server **118** implements a number of message processing technologies and functions, particularly related to the aggregation and other processing of content (e.g., textual and multimedia content) included in messages received from multiple instances of the messaging client **104**. As will be described in further detail, the text and media content from multiple sources may be aggregated into collections of content (e.g., called stories or galleries). These collections are then made available to the messaging client **104**. Other processor and memory intensive processing of data may also be performed server-side by the messaging server **118**, in view of the hardware requirements for such processing.

The application servers **114** also include an image processing server **122** that is dedicated to performing various image processing operations, typically with respect to images or video within the payload of a message sent from or received at the messaging server **118**.

The social network server **124** supports various social networking functions and services and makes these functions and services available to the messaging server **118**. To this end, the social network server **124** maintains and accesses an entity graph **308** (as shown in FIG. **3**) within the database **126**. Examples of functions and services supported by the social network server **124** include the identification of other users of the messaging system **100** with which a particular user has relationships or is "following," and also the identification of other entities and interests of a particular user.

Returning to the messaging client **104**, features and functions of an external resource (e.g., application **106**, a mini-program, or an applet) are made available to a user via an interface of the messaging client **104**. In this context, "external" refers to the fact that application **106** or applet is external to the messaging client **104**. The external resource is often provided by a third party but may also be provided by the creator or provider of the messaging client **104**. The messaging client **104** receives a user selection of an option to launch or access features of such an external resource. The external resource may be the application **106** installed on the client device **102** (e.g., a "native app"), or a small-scale version of the application (e.g., an "applet") that is hosted on the client device **102** or remote of the client device **102** (e.g., on third-party servers **110**). The small-scale version of the application includes a subset of features and functions of the application (e.g., the full-scale, native version of the application) and is implemented using a markup-language document. In some embodiments, the small-scale version of the application (e.g., an "applet") is a web-based, markup-language version of the application and is embedded in the messaging client **104**. In addition to using markup-language documents (e.g., a .*ml file), an applet may incorporate a scripting language (e.g., a .*js file or a .json file) and a style sheet (e.g., a .*ss file).

In response to receiving a user selection of the option to launch or access features of the external resource, the messaging client **104** determines whether the selected external resource is a web-based external resource or a locally-installed application **106**. In some cases, applications **106** that are locally installed on the client device **102** can be launched independently of and separately from the messaging client **104**, such as by selecting an icon, corresponding to the application **106**, on a home screen of the client device **102**. Small-scale versions of such applications can be launched or accessed via the messaging client **104**, and, in some embodiments, no or limited portions of the small-scale application can be accessed outside of the messaging client **104**. The small-scale application can be launched by the messaging client **104** receiving, from a third-party server **110** for example, a markup-language document associated with the small-scale application and processing such a document.

In response to determining that the external resource is a locally-installed application **106**, the messaging client **104** instructs the client device **102** to launch the external resource by executing locally-stored code corresponding to the external resource. In response to determining that the external resource is a web-based resource, the messaging client **104** communicates with the third-party servers **110** (for example) to obtain a markup-language document corresponding to the selected external resource. The messaging client **104** then processes the obtained markup-language document to present the web-based external resource within a user interface of the messaging client **104**.

The messaging client **104** can notify a user of the client device **102**, or other users related to such a user (e.g., "friends"), of activity taking place in one or more external resources. For example, the messaging client **104** can provide participants in a conversation (e.g., a chat session) in the messaging client **104** with notifications relating to the current or recent use of an external resource by one or more members of a group of users. One or more users can be invited to join in an active external resource or to launch a recently-used but currently inactive (in the group of friends) external resource. The external resource can provide participants in a conversation, each using respective messaging clients **104**, with the ability to share an item, status, state, or location in an external resource with one or more members of a group of users in a chat session. The shared item may be an interactive chat card with which members of the chat can interact, for example, to launch the corresponding external resource, view specific information within the external resource, or take the member of the chat to a specific location or state within the external resource. Within a given external resource, response messages can be sent to users on the messaging client **104**. The external resource can selectively include different media items in the responses based on the current context of the external resource.

The messaging client **104** can present a list of the available external resources (e.g., applications **106** or applets) to a user to launch or access a given external resource. This list can be presented in a context-sensitive menu. For example, the icons representing different ones of the application **106** (or applets) can vary based on how the menu is launched by the user (e.g., from a conversation interface or from a non-conversation interface).

System Architecture

FIG. **2** is a block diagram illustrating further details regarding the messaging system **100**, according to some examples. Specifically, the messaging system **100** is shown to comprise the messaging client **104** and the application

servers **114**. The messaging system **100** embodies a number of subsystems, which are supported on the client-side by the messaging client **104** and on the sever-side by the application servers **114**. These subsystems include, for example, an ephemeral timer system **202**, a collection management system **204**, an augmentation system **208**, a map system **210**, a game system **212**, an external resource system **214**, and a presence indication data management system **216**.

The ephemeral timer system **202** is responsible for enforcing the temporary or time-limited access to content by the messaging client **104** and the messaging server **118**. The ephemeral timer system **202** incorporates a number of timers that, based on duration and display parameters associated with a message, or collection of messages (e.g., a story), selectively enable access (e.g., for presentation and display) to messages and associated content via the messaging client **104**. Further details regarding the operation of the ephemeral timer system **202** are provided below.

The collection management system **204** is responsible for managing sets or collections of media (e.g., collections of text, image video, and audio data). A collection of content (e.g., messages, including images, video, text, and audio) may be organized into an "event gallery" or an "event story." Such a collection may be made available for a specified time period, such as the duration of an event to which the content relates. For example, content relating to a music concert may be made available as a "story" for the duration of that music concert. The collection management system **204** may also be responsible for publishing an icon that provides notification of the existence of a particular collection to the user interface of the messaging client **104**.

The collection management system **204** furthermore includes a curation interface **206** that allows a collection manager to manage and curate a particular collection of content. For example, the curation interface **206** enables an event organizer to curate a collection of content relating to a specific event (e.g., delete inappropriate content or redundant messages). Additionally, the collection management system **204** employs machine vision (or image recognition technology) and content rules to automatically curate a content collection. In certain examples, compensation may be paid to a user for the inclusion of user-generated content into a collection. In such cases, the collection management system **204** operates to automatically make payments to such users for the use of their content.

The augmentation system **208** provides various functions that enable a user to augment (e.g., annotate or otherwise modify or edit) media content associated with a message. For example, the augmentation system **208** provides functions related to the generation and publishing of media overlays for messages processed by the messaging system **100**. The augmentation system **208** operatively supplies a media overlay or augmentation (e.g., an image filter) to the messaging client **104** based on a geolocation of the client device **102**. In another example, the augmentation system **208** operatively supplies a media overlay to the messaging client **104** based on other information, such as social network information of the user of the client device **102**. A media overlay may include audio and visual content and visual effects. Examples of audio and visual content include pictures, texts, logos, animations, and sound effects. An example of a visual effect includes color overlaying. The audio and visual content or the visual effects can be applied to a media content item (e.g., a photo) at the client device **102**. For example, the media overlay may include text or an image that can be overlaid on top of a photograph taken by the client device **102**. In another example, the media overlay includes an identification of a location overlay (e.g., Venice beach), a name of a live event, or a name of a merchant overlay (e.g., Beach Coffee House). In another example, the augmentation system **208** uses the geolocation of the client device **102** to identify a media overlay that includes the name of a merchant at the geolocation of the client device **102**. The media overlay may include other indicia associated with the merchant. The media overlays may be stored in the database **126** and accessed through the database server **120**.

In some embodiments, the augmentation system **208** provides a user-based publication platform that enables users to select a geolocation on a map and upload content associated with the selected geolocation. The user may also specify circumstances under which a particular media overlay should be offered to other users. The augmentation system **208** generates a media overlay that includes the uploaded content and associates the uploaded content with the selected geolocation.

In other examples, the augmentation system **208** provides a merchant-based publication platform that enables merchants to select a particular media overlay associated with a geolocation via a bidding process. For example, the augmentation system **208** associates the media overlay of the highest bidding merchant with a corresponding geolocation for a predefined amount of time.

The map system **210** provides various geographic location functions and supports the presentation of map-based media content and messages by the messaging client **104**. For example, the map system **210** enables the display of user icons or avatars (e.g., stored in profile data **316**) on a map to indicate a current or past location of "friends" of a user, as well as media content (e.g., collections of messages including photographs and videos) generated by such friends, within the context of a map. For example, a message posted by a user to the messaging system **100** from a specific geographic location may be displayed within the context of a map at that particular location to "friends" of a specific user on a map interface of the messaging client **104**. A user can furthermore share his or her location and status information (e.g., using an appropriate status avatar) with other users of the messaging system **100** via the messaging client **104**, with this location and status information being similarly displayed within the context of a map interface of the messaging client **104** to selected users.

The game system **212** provides various gaming functions within the context of the messaging client **104**. The messaging client **104** provides a game interface providing a list of available games that can be launched by a user within the context of the messaging client **104**, and played with other users of the messaging system **100**. The messaging system **100** further enables a particular user to invite other users to participate in the play of a specific game, by issuing invitations to such other users from the messaging client **104**. The messaging client **104** also supports both the voice and text messaging (e.g., chats) within the context of gameplay, provides a leaderboard for the games, and also supports the provision of in-game rewards (e.g., coins and items).

The external resource system **214** provides an interface for the messaging client **104** to communicate with remote servers (e.g., third-party servers **110**) to launch or access external resources, i.e., applications or applets. The external resources may be mini-programs. Each third-party server **110** hosts, for example, a markup language (e.g., HTML5) based application or small-scale version of an application (e.g., tickets, game, utility, payment, or ride-sharing application). The messaging client **104** may launch a web-based resource (e.g., application) by accessing the HTML5 file

from the third-party servers **110** associated with the web-based resource. In certain examples, applications hosted by third-party servers **110** are programmed in JavaScript leveraging a Software Development Kit (SDK) provided by the messaging server **118**. The SDK includes APIs with functions that can be called or invoked by the web-based application. In certain examples, the messaging server **118** includes a JavaScript library that provides a given external resource access to certain user data of the messaging client **104**. HTML5 is used as an example technology for programming games, but applications and resources programmed based on other technologies can be used.

In order to integrate the functions of the SDK into the web-based resource, the SDK is downloaded by a third-party server **110** from the messaging server **118** or is otherwise received by the third-party server **110**. Once downloaded or received, the SDK is included as part of the application code of a web-based external resource. The code of the web-based resource can then call or invoke certain functions of the SDK to integrate features of the messaging client **104** into the web-based resource.

The SDK stored on the messaging server **118** effectively provides the bridge between an external resource (e.g., applications **106** or applets) and the messaging client **104**. This provides the user with a seamless experience of communicating with other users on the messaging client **104**, while also preserving the look and feel of the messaging client **104**. To bridge communications between an external resource and a messaging client **104**, in certain examples, the SDK facilitates communication between third-party servers **110** and the messaging client **104**. In certain examples, a Web ViewJavaScriptBridge running on a client device **102** establishes two one-way communication channels between an external resource and the messaging client **104**. Messages are sent between the external resource and the messaging client **104** via these communication channels asynchronously. Each SDK function invocation is sent as a message and callback. Each SDK function is implemented by constructing a unique callback identifier and sending a message with that callback identifier.

By using the SDK, not all information from the messaging client **104** is shared with third-party servers **110**. The SDK limits which information is shared based on the needs of the external resource. In certain examples, each third-party server **110** provides an HTML5 file corresponding to the web-based external resource to the messaging server **118**. The messaging server **118** can add a visual representation (such as a box art or other graphic) of the web-based external resource in the messaging client **104**. Once the user selects the visual representation or instructs the messaging client **104** through a graphical user interface of the messaging client **104** to access features of the web-based external resource, the messaging client **104** obtains the HTML5 file and instantiates the resources necessary to access the features of the web-based external resource.

In some embodiments, the visual representation of the web-based external resource, such as a mini-program, is accessible from the main conversation view or the experience pages. Upon user selection of the visual representation to instruct the messaging client **104** to launch, a web-based external resource type experience page (e.g., user interfaces **1010** or **1020** in FIG. **10**) is generated for accessing features of the web-based external resource. The experience page may include a text input bar and a graphical element expandable to show the message thread.

The messaging client **104** presents a graphical user interface (e.g., a landing page or title screen) for an external resource. During, before, or after presenting the landing page or title screen, the messaging client **104** determines whether the launched external resource has been previously authorized to access user data of the messaging client **104**. In response to determining that the launched external resource has been previously authorized to access user data of the messaging client **104**, the messaging client **104** presents another graphical user interface of the external resource that includes functions and features of the external resource. In response to determining that the launched external resource has not been previously authorized to access user data of the messaging client **104**, after a threshold period of time (e.g., 3 seconds) of displaying the landing page or title screen of the external resource, the messaging client **104** slides up (e.g., animates a menu as surfacing from the bottom or the middle of the screen, or other portion of the screen) a menu for authorizing the external resource to access the user data. The menu identifies the type of user data that the external resource will be authorized to use. In response to receiving a user selection of an accept option, the messaging client **104** adds the external resource to a list of authorized external resources and allows the external resource to access user data from the messaging client **104**. In some embodiments, the external resource is authorized by the messaging client **104** to access the user data in accordance with an OAuth **2** framework.

The messaging client **104** controls the type of user data that is shared with external resources based on the type of external resource being authorized. For example, external resources that include full-scale applications (e.g., an application **106**) are provided with access to the first type of user data (e.g., only two-dimensional avatars of users with or without different avatar characteristics). As another example, external resources that include small-scale versions of applications (e.g., web-based versions of applications) are provided with access to the second type of user data (e.g., payment information, two-dimensional avatars of users, three-dimensional avatars of users, and avatars with various avatar characteristics). Avatar characteristics include different ways to customize a look and feel of an avatar, such as different poses, facial features, clothing, and so forth.

The presence indication data management system **216** provides a highly interactive and engaging communication environment that allows users to stay informed of others' presence in a group conversation. In some embodiments, the presence indication data management system **216** allows users to continue the communication in various types of full-screen experience pages accessible from the main conversation view of a group conversation. The presence indication data management system **216** may generate and display other group users' user presence indicators on the main conversation view or the experience pages. The presence indicators represent other group users' presence status and the types of experience pages currently accessed by the group users.

In some embodiments, the presence indication data management system **216** generates and displays a page source graphical element indicating the page source from which a message is transmitted. The page source graphical element may be activated to redirect the user to the source page.

In some embodiments, the presence indication data management system **216** generates and displays an expandable text input bar and a list of chronologically ordered messages (e.g., message thread comprised by messages **1008**, **1018**, and **1006** as shown in FIG. **10**) received from the group users active from the main conversation view and experience pages.

Data Architecture

FIG. **3** is a schematic diagram illustrating data structures **300**, which may be stored in the database **126** of the messaging server system **108**, according to certain examples. While the content of the database **126** is shown to comprise a number of tables, it will be appreciated that the data could be stored in other types of data structures (e.g., as an object-oriented database).

The database **126** includes message data stored within a message table **302**. This message data includes, for any particular one message, at least message sender data, message recipient (or receiver) data, and a payload. Further details regarding information that may be included in a message, and included within the message data stored in the message table **302**, is described below with reference to FIG. **4**.

An entity table **306** stores entity data, and is linked (e.g., referentially) to an entity graph **308** and profile data **316**. Entities for which records are maintained within the entity table **306** may include individuals, corporate entities, organizations, objects, places, events, and so forth. Regardless of entity type, any entity regarding which the messaging server system **108** stores data may be a recognized entity. Each entity is provided with a unique identifier, as well as an entity type identifier (not shown).

The entity graph **308** stores information regarding relationships and associations between entities. Such relationships may be social, professional (e.g., work at a common corporation or organization) interested-based or activity-based, merely for example.

The profile data **316** stores multiple types of profile data about a particular entity. The profile data **316** may be selectively used and presented to other users of the messaging system **100**, based on privacy settings specified by a particular entity. Where the entity is an individual, the profile data **316** includes, for example, a user name, telephone number, address, and settings (e.g., notification and privacy settings), as well as a user-selected avatar representation (or collection of such avatar representations). A particular user may then selectively include one or more of these avatar representations within the content of messages communicated via the messaging system **100** and on map interfaces displayed by messaging clients **104** to other users. The collection of avatar representations may include "status avatars," which present a graphical representation of a status or activity that the user may select to communicate at a particular time.

Where the entity is a group, the profile data **316** for the group may similarly include one or more avatar representations associated with the group, in addition to the group name, members, and various settings (e.g., notifications) for the relevant group.

The database **126** also stores augmentation data, such as overlays or filters, in an augmentation table **310**. The augmentation data is associated with and applied to videos (for which data is stored in a video table **304**) and images (for which data is stored in an image table **312**).

Filters, in some embodiments, are overlays that are displayed as overlaid on an image or video during presentation to a recipient user. Filters may be of various types, including user-selected filters from a set of filters presented to a sending user by the messaging client **104** when the sending user is composing a message. Other types of filters include geolocation filters (also known as geo-filters), which may be presented to a sending user based on geographic location. For example, geolocation filters specific to a neighborhood or special location may be presented within a user interface by the messaging client **104**, based on geolocation information determined by a Global Positioning System (GPS) unit of the client device **102**.

Another type of filter is a data filter, which may be selectively presented to a sending user by the messaging client **104**, based on other inputs or information gathered by the client device **102** during the message creation process. Examples of data filters include current temperature at a specific location, a current speed at which a sending user is traveling, battery life for a client device **102**, or the current time.

Other augmentation data that may be stored within the image table **312** includes augmented reality content items (e.g., corresponding to applying Lenses or augmented reality experiences). An augmented reality content item may be a real-time special effect and sound that may be added to an image or a video.

As described above, augmentation data includes augmented reality content items, overlays, image transformations, and augmented reality images, and similar terms refer to modifications that may be applied to image data (e.g., videos or images). This includes real-time modifications, which modify an image as it is captured using device sensors (e.g., one or multiple cameras) of a client device **102** and then displayed on a screen of the client device **102** with the modifications. This also includes modifications to stored content, such as video clips in a gallery that may be modified. For example, in a client device **102** with access to multiple augmented reality content items, a user can use a single video clip with multiple augmented reality content items to see how the different augmented reality content items will modify the stored clip. For example, multiple augmented reality content items that apply different pseudorandom movement models can be applied to the same content by selecting different augmented reality content items for the content. Similarly, real-time video capture may be used with an illustrated modification to show how video images currently being captured by sensors of a client device **102** would modify the captured data. Such data may simply be displayed on the screen and not stored in memory, or the content captured by the device sensors may be recorded and stored in memory with or without the modifications (or both). In some systems, a preview feature can show how different augmented reality content items will look within different windows in a display at the same time. This can, for example, enable multiple windows with different pseudorandom animations to be viewed on a display at the same time.

Data and various systems using augmented reality content items or other such transform systems to modify content using this data can thus involve detection of objects (e.g., faces, hands, bodies, cats, dogs, surfaces, objects, etc.), tracking of such objects as they leave, enter, and move around the field of view in video frames, and the modification or transformation of such objects as they are tracked. In various examples, different methods for achieving such transformations may be used. Some examples may involve generating a three-dimensional mesh model of the object or objects and using transformations and animated textures of the model within the video to achieve the transformation. In other examples, tracking of points on an object may be used to place an image or texture (which may be two dimensional or three dimensional) at the tracked position. In still further examples, neural network analysis of video frames may be used to place images, models, or textures in content (e.g., images or frames of video). Augmented reality content items thus refer both to the images, models, and textures used to

create transformations in content, as well as to additional modeling and analysis information needed to achieve such transformations with object detection, tracking, and placement.

Real-time video processing can be performed with any kind of video data (e.g., video streams, video files, etc.) saved in a memory of a computerized system of any kind. For example, a user can load video files and save them in a memory of a device, or can generate a video stream using sensors of the device. Additionally, any objects can be processed using a computer animation model, such as a human's face and parts of a human body, animals, or non-living things such as chairs, cars, or other objects.

In some embodiments, when a particular modification is selected along with content to be transformed, elements to be transformed are identified by the computing device and then detected and tracked if they are present in the frames of the video. The elements of the object are modified according to the request for modification, thus transforming the frames of the video stream. Transformation of frames of a video stream can be performed by different methods for different kinds of transformation. For example, for transformations of frames mostly referring to changing forms of object's elements characteristic points for each element of an object are calculated (e.g., using an Active Shape Model (ASM) or other known methods). Then, a mesh based on the characteristic points is generated for each of the at least one element of the object. This mesh is used in the following stage of tracking the elements of the object in the video stream. In the process of tracking, the mentioned mesh for each element is aligned with a position of each element. Then, additional points are generated on the mesh. A first set of first points is generated for each element based on a request for modification, and a set of second points is generated for each element based on the set of first points and the request for modification. Then, the frames of the video stream can be transformed by modifying the elements of the object on the basis of the sets of first and second points and the mesh. In such a method, a background of the modified object can be changed or distorted as well by tracking and modifying the background.

In some embodiments, transformations changing some areas of an object using its elements can be performed by calculating characteristic points for each element of an object and generating a mesh based on the calculated characteristic points. Points are generated on the mesh and then various areas based on the points are generated. The elements of the object are then tracked by aligning the area for each element with a position for each of the at least one element, and properties of the areas can be modified based on the request for modification, thus transforming the frames of the video stream. Depending on the specific request for modification, properties of the mentioned areas can be transformed in different ways. Such modifications may involve changing color of areas; removing at least some part of areas from the frames of the video stream; including one or more new objects into areas which are based on a request for modification; and modifying or distorting the elements of an area or object. In various examples, any combination of such modifications or other similar modifications may be used. For certain models to be animated, some characteristic points can be selected as control points to be used in determining the entire state-space of options for the model animation.

In some embodiments of a computer animation model to transform image data using face detection, the face is detected on an image with use of a specific face detection algorithm (e.g., Viola-Jones). Then, an Active Shape Model (ASM) algorithm is applied to the face region of an image to detect facial feature reference points.

Other methods and algorithms suitable for face detection can be used. For example, in some embodiments, features are located using a landmark, which represents a distinguishable point present in most of the images under consideration. For facial landmarks, for example, the location of the left eye pupil may be used. If an initial landmark is not identifiable (e.g., if a person has an eyepatch), secondary landmarks may be used. Such landmark identification procedures may be used for any such objects. In some embodiments, a set of landmarks forms a shape. Shapes can be represented as vectors using the coordinates of the points in the shape. One shape is aligned to another with a similarity transform (allowing translation, scaling, and rotation) that minimizes the average Euclidean distance between shape points. The mean shape is the mean of the aligned training shapes.

In some embodiments, a search is started for landmarks from the mean shape aligned to the position and size of the face determined by a global face detector. Such a search then repeats the steps of suggesting a tentative shape by adjusting the locations of shape points by template matching of the image texture around each point and then conforming the tentative shape to a global shape model until convergence occurs. In some systems, individual template matches are unreliable, and the shape model pools the results of the weak template matches to form a stronger overall classifier. The entire search is repeated at each level in an image pyramid, from coarse to fine resolution.

A transformation system can capture an image or video stream on a client device (e.g., the client device **102**) and perform complex image manipulations locally on the client device **102** while maintaining a suitable user experience, computation time, and power consumption. The complex image manipulations may include size and shape changes, emotion transfers (e.g., changing a face from a frown to a smile), state transfers (e.g., aging a subject, reducing apparent age, changing gender), style transfers, graphical element application, and any other suitable image or video manipulation implemented by a convolutional neural network that has been configured to execute efficiently on the client device **102**.

In some embodiments, a computer animation model to transform image data can be used by a system where a user may capture an image or video stream of the user (e.g., a selfie) using a client device **102** having a neural network operating as part of a messaging client **104** operating on the client device **102**. The transformation system operating within the messaging client **104** determines the presence of a face within the image or video stream and provides modification icons associated with a computer animation model to transform image data, or the computer animation model can be present as associated with an interface described herein. The modification icons include changes that may be the basis for modifying the user's face within the image or video stream as part of the modification operation. Once a modification icon is selected, the transform system initiates a process to convert the image of the user to reflect the selected modification icon (e.g., generate a smiling face on the user). A modified image or video stream may be presented in a graphical user interface displayed on the client device **102** as soon as the image or video stream is captured and a specified modification is selected. The transformation system may implement a complex convolutional neural network on a portion of the image or video stream to

generate and apply the selected modification. That is, the user may capture the image or video stream and be presented with a modified result in real-time or near real-time once a modification icon has been selected. Further, the modification may be persistent while the video stream is being captured and the selected modification icon remains toggled. Machine taught neural networks may be used to enable such modifications.

The graphical user interface, presenting the modification performed by the transform system, may supply the user with additional interaction options. Such options may be based on the interface used to initiate the content capture and selection of a particular computer animation model (e.g., initiation from a content creator user interface). In various examples, a modification may be persistent after an initial selection of a modification icon. The user may toggle the modification on or off by tapping or otherwise selecting the face being modified by the transformation system and store it for later viewing or browse to other areas of the imaging application. Where multiple faces are modified by the transformation system, the user may toggle the modification on or off globally by tapping or selecting a single face modified and displayed within a graphical user interface. In some embodiments, individual faces, among a group of multiple faces, may be individually modified, or such modifications may be individually toggled by tapping or selecting the individual face or a series of individual faces displayed within the graphical user interface. In some embodiments, the graphical user interface may be the main conversation view of a group conversation or an experience page accessible from the main conversation view.

A story table **314** stores data regarding collections of messages and associated image, video, or audio data, which are compiled into a collection (e.g., a story or a gallery). The creation of a particular collection may be initiated by a particular user (e.g., each user for which a record is maintained in the entity table **306**). A user may create a "personal story" in the form of a collection of content that has been created and sent/broadcast by that user. To this end, the user interface of the messaging client **104** may include an icon that is user-selectable to enable a sending user to add specific content to his or her personal story.

A collection may also constitute a "live story," which is a collection of content from multiple users that is created manually, automatically, or using a combination of manual and automatic techniques. For example, a "live story" may constitute a curated stream of user-submitted content from various locations and events. Users whose client devices have location services enabled and are at a common location event at a particular time may, for example, be presented with an option, via a user interface of the messaging client **104**, to contribute content to a particular live story. The live story may be identified to the user by the messaging client **104**, based on his or her location. The end result is a "live story" told from a community perspective.

A further type of content collection is known as a "location story," which enables a user whose client device **102** is located within a specific geographic location (e.g., on a college or university campus) to contribute to a particular collection. In some embodiments, a contribution to a location story may require a second degree of authentication to verify that the end user belongs to a specific organization or other entity (e.g., is a student on the university campus).

As mentioned above, the video table **304** stores video data that, in some embodiments, is associated with messages for which records are maintained within the message table **302**. Similarly, the image table **312** stores image data associated with messages for which message data is stored in the entity table **306**. The entity table **306** may associate various augmentations from the augmentation table **310** with various images and videos stored in the image table **312** and the video table **304**.

Data Communications Architecture

FIG. **4** is a schematic diagram illustrating a structure of a message **400**, according to some examples, generated by a messaging client **104** for communication to a further messaging client **104** or the messaging server **118**. The content of a particular message **400** is used to populate the message table **302** stored within the database **126**, accessible by the messaging server **118**. Similarly, the content of a message **400** is stored in memory as "in-transit" or "in-flight" data of the client device **102** or the application servers **114**. A message **400** is shown to include the following example components:

- message identifier **402**: a unique identifier that identifies the message **400**.
- message text payload **404**: text, to be generated by a user via a user interface of the client device **102**, and that is included in the message **400**.
- message image payload **406**: image data, captured by a camera component of a client device **102** or retrieved from a memory component of a client device **102**, and that is included in the message **400**. Image data for a sent or received message **400** may be stored in the image table **312**.
- message video payload **408**: video data, captured by a camera component or retrieved from a memory component of the client device **102**, and that is included in the message **400**. Video data for a sent or received message **400** may be stored in the video table **304**.
- message audio payload **410**: audio data, captured by a microphone or retrieved from a memory component of the client device **102**, and that is included in the message **400**.
- message augmentation data **412**: augmentation data (e.g., filters, stickers, or other annotations or enhancements) that represents augmentations to be applied to message image payload **406**, message video payload **408**, or message audio payload **410** of the message **400**. Augmentation data for a sent or received message **400** may be stored in the augmentation table **310**.
- message duration parameter **414**: parameter value indicating, in seconds, the amount of time for which content of the message (e.g., the message image payload **406**, message video payload **408**, message audio payload **410**) is to be presented or made accessible to a user via the messaging client **104**.
- message geolocation parameter **416**: geolocation data (e.g., latitudinal and longitudinal coordinates) associated with the content payload of the message. Multiple message geolocation parameter **416** values may be included in the payload, each of these parameter values being associated to content items included in the content (e.g., a specific image within the message image payload **406**, or a specific video in the message video payload **408**).
- message story identifier **418**: identifier values identifying one or more content collections (e.g., "stories" identified in the story table **314**) with which a particular content item in the message image payload **406** of the message **400** is associated. For example, multiple images within the message image payload **406** may each be associated with multiple content collections using identifier values.

message tag **420**: each message **400** may be tagged with multiple tags, each of which is indicative of the subject matter of content included in the message payload. For example, where a particular image included in the message image payload **406** depicts an animal (e.g., a lion), a tag value may be included within the message tag **420** that is indicative of the relevant animal. Tag values may be generated manually, based on user input, or may be automatically generated using, for example, image recognition.

message sender identifier **422**: an identifier (e.g., a messaging system identifier, email address, or device identifier) indicative of a user of the client device **102** on which the message **400** was generated and from which the message **400** was sent.

message receiver identifier **424**: an identifier (e.g., a messaging system identifier, email address, or device identifier) indicative of a user of the client device **102** to which the message **400** is addressed.

The contents (e.g., values) of the various components of message **400** may be pointers to locations in tables within which content data values are stored. For example, an image value in the message image payload **406** may be a pointer to (or address of) a location within an image table **312**. Similarly, values within the message video payload **408** may point to data stored within a video table **304**, values stored within the message augmentation data **412** may point to data stored in an augmentation table **310**, values stored within the message story identifier **418** may point to data stored in a story table **314**, and values stored within the message sender identifier **422** and the message receiver identifier **424** may point to user records stored within an entity table **306**.

Time-Based Access Limitation Architecture

FIG. **5** is a schematic diagram illustrating an access-limiting process **500**, in terms of which access to content (e.g., an ephemeral message **502** and associated multimedia payload of data) or a content collection (e.g., an ephemeral message group **504**) may be time-limited (e.g., made ephemeral).

An ephemeral message **502** is shown to be associated with a message duration parameter **506**, the value of which determines an amount of time that the ephemeral message **502** will be displayed to a receiving user of the ephemeral message **502** by the messaging client **104**. In some embodiments, an ephemeral message **502** is viewable by a receiving user for up to a maximum of 10 seconds, depending on the amount of time that the sending user specifies using the message duration parameter **506**.

The message duration parameter **506** and the message receiver identifier **424** are shown to be inputs to a message timer **510**, which is responsible for determining the amount of time that the ephemeral message **502** is shown to a particular receiving user identified by the message receiver identifier **424**. In particular, the ephemeral message **502** will only be shown to the relevant receiving user for a time period determined by the value of the message duration parameter **506**. The message timer **510** is shown to provide output to a more generalized ephemeral timer system **202**, which is responsible for the overall timing of display of content (e.g., an ephemeral message **502**) to a receiving user.

The ephemeral message **502** is shown in FIG. **5** to be included within an ephemeral message group **504** (e.g., a collection of messages in a personal story, or an event story). The ephemeral message group **504** has an associated group duration parameter **508**, a value of which determines a time duration for which the ephemeral message group **504** is presented and accessible to users of the messaging system **100**. The group duration parameter **508**, for example, may be the duration of a music concert, where the ephemeral message group **504** is a collection of content pertaining to that concert. Alternatively, a user (either the owning user or a curator user) may specify the value for the group duration parameter **508** when performing the setup and creation of the ephemeral message group **504**.

Additionally, each ephemeral message **502** within the ephemeral message group **504** has an associated group participation parameter **512**, a value of which determines the duration of time for which the ephemeral message **502** will be accessible within the context of the ephemeral message group **504**. Accordingly, a particular ephemeral message group **504** may "expire" and become inaccessible within the context of the ephemeral message group **504**, prior to the ephemeral message group **504** itself expiring in terms of the group duration parameter **508**. The group duration parameter **508**, group participation parameter **512**, and message receiver identifier **424** each provide input to a group timer **514**, which operationally determines, firstly, whether a particular ephemeral message **502** of the ephemeral message group **504** will be displayed to a particular receiving user and, if so, for how long. Note that the ephemeral message group **504** is also aware of the identity of the particular receiving user as a result of the message receiver identifier **424**.

Accordingly, the group timer **514** operationally controls the overall lifespan of an associated ephemeral message group **504**, as well as an individual ephemeral message **502** included in the ephemeral message group **504**. In some embodiments, each and every ephemeral message **502** within the ephemeral message group **504** remains viewable and accessible for a time period specified by the group duration parameter **508**. In a further example, a certain ephemeral message **502** may expire, within the context of ephemeral message group **504**, based on a group participation parameter **512**. Note that a message duration parameter **506** may still determine the duration of time for which a particular ephemeral message **502** is displayed to a receiving user, even within the context of the ephemeral message group **504**. Accordingly, the message duration parameter **506** determines the duration of time that a particular ephemeral message **502** is displayed to a receiving user, regardless of whether the receiving user is viewing that ephemeral message **502** inside or outside the context of an ephemeral message group **504**.

The ephemeral timer system **202** may furthermore operationally remove a particular ephemeral message **502** from the ephemeral message group **504** based on a determination that it has exceeded an associated group participation parameter **512**. For example, when a sending user has established a group participation parameter **512** of 24 hours from posting, the ephemeral timer system **202** will remove the relevant ephemeral message **502** from the ephemeral message group **504** after the specified 24 hours. The ephemeral timer system **202** also operates to remove an ephemeral message group **504** when either the group participation parameter **512** for each and every ephemeral message **502** within the ephemeral message group **504** has expired, or when the ephemeral message group **504** itself has expired in terms of the group duration parameter **508**.

In certain use cases, a creator of a particular ephemeral message group **504** may specify an indefinite group duration parameter **508**. In this case, the expiration of the group participation parameter **512** for the last remaining ephemeral message **502** within the ephemeral message group **504** will determine when the ephemeral message group **504** itself

expires. In this case, a new ephemeral message **502**, added to the ephemeral message group **504**, with a new group participation parameter **512**, effectively extends the life of an ephemeral message group **504** to equal the value of the group participation parameter **512**.

Responsive to the ephemeral timer system **202** determining that an ephemeral message group **504** has expired (e.g., is no longer accessible), the ephemeral timer system **202** communicates with the messaging system **100** (and, for example, specifically the messaging client **104**) to cause an indicium (e.g., an icon) associated with the relevant ephemeral message group **504** to no longer be displayed within a user interface of the messaging client **104**. Similarly, when the ephemeral timer system **202** determines that the message duration parameter **506** for a particular ephemeral message **502** has expired, the ephemeral timer system **202** causes the messaging client **104** to no longer display an indicium (e.g., an icon or textual identification) associated with the ephemeral message **502**.

User Presence Indication Data Management

In some embodiments, the presence indication data management system **216** allows users to continue the communication in various types of full-screen experience pages accessible from the main conversation view of a group conversation. The presence indication data management system **216** may generate and display other group users' user presence indicators on the main conversation view or the experience pages. The presence indicators represent other group users' presence status and the types of experience pages currently accessed by the group users.

In some embodiments, the presence indication data management system **216** generates and displays a page source graphical element indicating the page source from which a message is transmitted. The page source graphical element may be activated to redirect the user to the source page.

In some embodiments, the presence indication data management system **216** generates and displays an expandable text input bar and a graphical element that is expandable to display a list of chronologically ordered messages (e.g., message thread) sent by the plural users from the main conversation view and each of the experience pages.

FIG. **6** illustrates a process **600** of providing presence indicators of users in a conversation, in accordance with one embodiment. The operations of process **600** may be performed by any number of different systems, such as the messaging client **104** described herein or the messaging server **114**, or any portion thereof, such as a processor included in any of the systems, including the presence indication data management system **216**.

At operation **602**, the processor provides for a group conversation between multiple users, including a first user and a second user. The group conversation may be a group chat between more than two users or a private chat between two users. The group conversation includes a main conversation view and an experience page that is accessible from the main conversation view. In some embodiments, the group conversation may include more than one experience page. An experience page may be a full-screen display on a user interface generated upon activating a media content item, a web-based external resource, or a full-screen call accessible from the group conversation. A media content item may be an image, a video, audio, or a weblink.

At operation **604**, the processor determines that the second user is active within one of the main conversation view or the experience page. The determination of the active status of a particular user may include detection of user activities associated with a particular user interface, either the main conversation view or an experience page. For example, if the processor detects a user interaction with the main conversation view within a pre-determined time period, the processor may determine that the user is currently active within the main conversation view.

At operation **606**, upon determining that the second user is active in the main conversation view, the processor provides a first graphical element for display on the first device of the first user. The first graphical element (not shown) includes an avatar and the name of the second user.

At operation **608**, upon determining that the second user is active in the experience page instead of the main conversation view, the processor provides a second graphical element for display on the first device. The second graphical element includes the avatar and name of the second user and an icon representing the type of the experience page. For example, as shown in FIG. **9**, the user interfaces **910**, **920**, **930**, and **940** are examples of different types of experience pages. Specifically, the experience page **910** is generated as a full-screen display of an image, experience page **920** is generated as a full-screen display of a video or audio, experience page **930** is generated as a full-screen display of a weblink, and experience page **940** is generated as a full-screen display of a web-based external resource (e.g., a mini-program).

The graphical elements **902**, **912**, **922**, **932** are examples of the second graphical element (e.g., presence indicators). Each example shows the second graphical element generated for a different type of experience page. Specifically, element **902** represents an image type of experience page, element **912** represents a video or audio type of experience page, element **922** represents a weblink type of experience page, and element **932** represents a mini-program type of experience page. In one example, if the processor determines the second user is currently viewing the image as shown in experience page **910**, the processor may generate a silhouette symbol (e.g., element **904**) representing the image on the device of other users in the group conversation. As shown in element **902**, the processor may display a presence indicator to include the silhouette symbol in conjunction with the name (e.g., John) and the avatar of the second user (e.g., the pecking avatar with hands showing half of the face) on the device of other users in the group conversation. Thereby, others may know the type of content John is currently viewing and whether he is currently present in the group conversation.

At operation **610**, the processor may determine that the second user is no longer active within one of the main conversation view or the experience page. The detection may be based on a lack of user activity detected from the device of the second user within a pre-determined time period. The pre-determined time period may be configured to range from few seconds to several minutes, for example. The shorter it is, the more likely a user remains active within the main conversation view or the experience page.

At operation **612**, upon determining that the second user is no longer active, the processor may provide a third graphical element for display on the first device of the first user. The third graphical element includes only the name of the second user. An example of the third graphical element may be the element **1002** as shown in FIG. **10**. The element **1002** may be displayed in muted colors, in contrast with vivid colors, representing an "absence" or "offline" status of the user (e.g., Emma).

In some embodiments, each experience page may include an expandable text input bar (element **934** as shown in FIG. **9**) and a fourth graphical element (e.g., element **936**) that is

expandable to display a list of messages from the users of the group conversation. For example, a user may tab on the expandable text input bar **934** on a user interface to trigger a display of a keyboard (not shown), and may tab on the graphical element **936** to trigger a display of a full message thread or only the unread messages from the group conversation. The number of unread messages may appear on the fourth graphical element. The number "1" as shown in element **936** represents one unread message. The message thread (not shown) may be displayed in the left portion of the user interface **940**, and may be dismissed when the user tabs any empty space (e.g., portions where the messages are not displayed) of the user interface.

FIG. **7** illustrates a process **700** of providing page source indicators based on user presence status, in accordance with one embodiment. The operations of process **700** may be performed by any number of different systems, such as the messaging client **104** described herein or the messaging server **114**, or any portion thereof, such as a processor included in any of the systems, including the presence indication data management system **216**.

At operation **702**, the processor receives the first message from a first device associated with a first user. The first message may be sent to a group conversation joined by multiple users, including the first user and a second user. The group conversation includes the main conversation view and an experience page that is accessible from the main conversation view. In some embodiments, the group conversation may include more than one experience page. An experience page may be a full-screen display on a user interface generated upon activating a media content item, a web-based external resource, or a video or audio call accessible from the group conversation. A media content item may be an image, a video, audio, or a weblink.

At operation **704**, the processor determines the first message was transmitted from the first experience page. For example, the processor may identify the page source identifier included in the metadata of the first message to determine if the message was sent from the user interface of the first experience page.

At operation **706**, the processor detects that the first user is currently active within the first experience page and the second user is active in the main conversation view. The determination of the active status of a particular user may include detection of user activities associated with a particular user interface. For example, if the processor detects a user interaction with the main conversation view within a pre-determined time period, the processor may determine that the user is currently active within the main conversation view.

At operation **708**, the processor causes the display of the first message and a page source graphical element on a second device associated with the second user. An example of the page source graphical element may be element **1004** as shown in FIG. **10** or element **1102** as shown in FIG. **11**. The page source graphical element includes a name of the first user and a page source indicator of the first experience page, such as "From Main Chat" in element **1004**, or "From xyz.com" in element **1102**.

At operation **710**, the processor determines that the first experience page has not been previously accessed by the second user. The determination may be based on an access identifier in the metadata associated with the first experience page.

At operation **712**, upon detecting a user selection of the page source graphical element, the processor causes the display of the first experience page in a full-screen display on the second device. A user may tab on the page source graphical element to trigger the full-screen display of the corresponding experience page. For example, in user interface **1020**, as shown in FIG. **10**, a user may tab on the page source graphical element **1004** to activate the display of the main conversation view, such as user interface **1120**. As another example, in user interface **1120**, as shown in FIG. **11**, a user may tab on the page source graphical element **1102** to activate the display of the weblink type experience page as shown in user interface **1110**.

FIG. **8** illustrates a process **800** of withholding page source indicators based on user presence status, in accordance with one embodiment. The operations of process **800** may be performed by any number of different systems, such as the messaging client **104** described herein or the messaging server **114**, or any portion thereof, such as a processor included in any of the systems, including the presence indication data management system **216**.

At operation **802**, the processor receives a second message from the first device associated with the first user. The first message may be sent to a group conversation joined by multiple users, including the first user and a second user. The group conversation includes a main conversation view and an experience page that is accessible from the main conversation view.

At operation **804**, the processor determines the second message was transmitted from the first experience page. For example, the processor may identify the page source identifier included in the metadata of the first message to determine if the message was sent from the user interface of the first experience page.

At operation **806**, the processor detects that both the first user and the second user are active within the first experience page. The determination of the active status of a particular user may include detection of user activities associated with a particular user interface. For example, if the processor detects a user interaction with the main conversation view within a pre-determined time period, the processor may determine that the user is currently active within the main conversation view.

At operation **808**, the processor causes the display of the second message to include the content of the second message without a showing of the page source graphical element referring to the first experience page as the page source from which the message was sent. For example, the second message may be displayed as element **1006**, as shown in FIG. **10**. In some embodiments, the processor withholds the display of page source graphical element if both users are accessing the same experience page, such as the user interface **1020**, as shown in FIG. **10**.

FIG. **9** illustrates user interfaces related to presence indicators displayed on a client device, in accordance with one embodiment. As shown in FIG. **9**, the user interfaces **910**, **920**, **930**, and **940** are examples of different types of experience pages. Specifically, user interface **910** is an image type experience page, user interface **920** is a video or audio type experience page, user interface **930** is a weblink type of experience page, and user interface **940** is a mini-program or game type of experience page. The graphical elements **902**, **912**, **922**, **932** included in each experience page are examples of the second graphical element (e.g., presence indicators) of the particular user named "John." If more users are included in a group conversation, an experience page may include a presence indicator for each user except for the user of the display device. The presence indicators may be displayed at the bottom portion (e.g., above the expandable text bar) of the experience pages.

FIG. **10** illustrates user interfaces related to presence indicators and page source indicators displayed on a client device, in accordance with one embodiment. The user interface **1010** may be a mini-program type of experience page. A message **1016** displayed on the user interface **1010** includes the content of the message "Can't join," the name of the user "John," and the page source indicator "From Main Chat." The page source indicator may be in muted grey color, indicating that the message has been viewed in the main conversation view by the user of the display device.

The user interface **1020** may be the user interface **1010** after the text input bar **1014** is activated and expanded into the keyboard **1012**. The presence indicators of users John, Eunice, and Emma are displayed above keyboard **1012**. A message **1008** is displayed in the user interface **1020**, and includes the content of the message "I'm starving-let's go eat," the name of the user "Mike," and the page source indicator "From Main Chat." The page source indicator in message **1008** may be associated with vivid colors, indicating that the message has not been viewed in the main conversation view by the user of the display device, and may be activated to direct the user to the main conversation view.

FIG. **11** illustrates user interfaces related to page source indicators displayed on a client device, in accordance with one embodiment. The user interface **1120** may be the main conversation view of the group conversation, and the user interface **1110** may be one of the experience pages accessible from the main conversation view. A message **1104** includes the content of the message "I love him," the name of the user Mike, and a selectable page source indicator "From xyz.com." Upon activation by user selection, the page source indicator may be triggered to cause the display of user interface **1110**, which is a weblink type experience page. The user interface **1110** includes a text input bar **1106** that is expandable to display a keyboard, such as the keyboard **1012** as shown in FIG. **10**.

Machine Architecture

FIG. **12** is a diagrammatic representation of the machine **1200** within which instructions **1208** (e.g., software, a program, an application, an applet, an app, or other executable code) for causing the machine **1200** to perform any one or more of the methodologies discussed herein may be executed. For example, the instructions **1208** may cause the machine **1200** to execute any one or more of the methods described herein. The instructions **1208** transform the general, non-programmed machine **1200** into a particular machine **1200** programmed to carry out the described and illustrated functions in the manner described. The machine **1200** may operate as a standalone device or may be coupled (e.g., networked) to other machines. In a networked deployment, the machine **1200** may operate in the capacity of a server machine or a client machine in a server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine **1200** may comprise, but not be limited to, a server computer, a client computer, a personal computer (PC), a tablet computer, a laptop computer, a netbook, a set-top box (STB), a personal digital assistant (PDA), an entertainment media system, a cellular telephone, a smartphone, a mobile device, a wearable device (e.g., a smartwatch), a smart home device (e.g., a smart appliance), other smart devices, a web appliance, a network router, a network switch, a network bridge, or any machine capable of executing the instructions **1208**, sequentially or otherwise, that specify actions to be taken by the machine **1200**. Further, while only a single machine **1200** is illustrated, the term "machine" shall also be taken to include a collection of machines that individually or jointly execute the instructions **1208** to perform any one or more of the methodologies discussed herein. The machine **1200**, for example, may comprise the client device **102** or any one of a number of server devices forming part of the messaging server system **108**. In some embodiments, the machine **1200** may also comprise both client and server systems, with certain operations of a particular method or algorithm being performed on the server-side and with certain operations of the particular method or algorithm being performed on the client-side.

The machine **1200** may include processors **1202**, memory **1204**, and input/output (I/O) components **1238**, which may be configured to communicate with each other via a bus **1240**. In an example, the processors **1202** (e.g., a Central Processing Unit (CPU), a Reduced Instruction Set Computing (RISC) Processor, a Complex Instruction Set Computing (CISC) Processor, a Graphics Processing Unit (GPU), a Digital Signal Processor (DSP), an Application Specific Integrated Circuit (ASIC), a Radio-Frequency Integrated Circuit (RFIC), another processor, or any suitable combination thereof) may include, for example, a processor **1206** and a processor **1210** that execute the instructions **1208**. The term "processor" is intended to include multi-core processors that may comprise two or more independent processors (sometimes referred to as "cores") that may execute instructions contemporaneously. Although FIG. **12** shows multiple processors **1202**, the machine **1200** may include a single processor with a single-core, a single processor with multiple cores (e.g., a multi-core processor), multiple processors with a single core, multiple processors with multiples cores, or any combination thereof.

The memory **1204** includes a main memory **1212**, a static memory **1214**, and a storage unit **1216**, all accessible to the processors **1202** via the bus **1240**. The main memory **1204**, the static memory **1214**, and storage unit **1216** store the instructions **1208** embodying any one or more of the methodologies or functions described herein. The instructions **1208** may also reside, completely or partially, within the main memory **1212**, within the static memory **1214**, within machine-readable medium **1218**, within the storage unit **1216**, within at least one of the processors **1202** (e.g., within the processor's cache memory), or any suitable combination thereof, during execution thereof by the machine **1200**.

The I/O components **1238** may include a wide variety of components to receive input, provide output, produce output, transmit information, exchange information, capture measurements, and so on. The specific I/O components **1238** that are included in a particular machine will depend on the type of machine. For example, portable machines such as mobile phones may include a touch input device or other such input mechanisms, while a headless server machine will likely not include such a touch input device. It will be appreciated that the I/O components **1238** may include many other components that are not shown in FIG. **12**. In various examples, the I/O components **1238** may include user output components **1224** and user input components **1226**. The user output components **1224** may include visual components (e.g., a display such as a plasma display panel (PDP), a light-emitting diode (LED) display, a liquid crystal display (LCD), a projector, or a cathode ray tube (CRT)), acoustic components (e.g., speakers), haptic components (e.g., a vibratory motor, resistance mechanisms), other signal generators, and so forth. The user input components **1226** may include alphanumeric input components (e.g., a keyboard, a touch screen configured to receive alphanumeric input, a photo-optical keyboard, or other alphanumeric input components), point-based input components (e.g., a mouse, a

touchpad, a trackball, a joystick, a motion sensor, or another pointing instrument), tactile input components (e.g., a physical button, a touch screen that provides location and force of touches or touch gestures, or other tactile input components), audio input components (e.g., a microphone), and the like.

In further examples, the I/O components **1238** may include biometric components **1228**, motion components **1230**, environmental components **1232**, or position components **1234**, among a wide array of other components. For example, the biometric components **1228** include components to detect expressions (e.g., hand expressions, facial expressions, vocal expressions, body gestures, or eye-tracking), measure biosignals (e.g., blood pressure, heart rate, body temperature, perspiration, or brain waves), identify a person (e.g., voice identification, retinal identification, facial identification, fingerprint identification, or electroencephalogram-based identification), and the like. The motion components **1230** include acceleration sensor components (e.g., accelerometer), gravitation sensor components, or rotation sensor components (e.g., gyroscope).

The environmental components **1232** include, for example, one or more cameras (with still image/photograph and video capabilities), illumination sensor components (e.g., photometer), temperature sensor components (e.g., one or more thermometers that detect ambient temperature), humidity sensor components, pressure sensor components (e.g., barometer), acoustic sensor components (e.g., one or more microphones that detect background noise), proximity sensor components (e.g., infrared sensors that detect nearby objects), gas sensors (e.g., gas detection sensors to detection concentrations of hazardous gases for safety or to measure pollutants in the atmosphere), or other components that may provide indications, measurements, or signals corresponding to a surrounding physical environment.

With respect to cameras, the client device **102** may have a camera system comprising, for example, front cameras on a front surface of the client device **102** and rear cameras on a rear surface of the client device **102**. The front cameras may, for example, be used to capture still images and video of a user of the client device **102** (e.g., "selfies"), which may then be augmented with augmentation data (e.g., filters) described above. The rear cameras may, for example, be used to capture still images and videos in a more traditional camera mode, with these images similarly being augmented with augmentation data. In addition to front and rear cameras, the client device **102** may also include a 360° camera for capturing 360° photographs and videos.

Further, the camera system of a client device **102** may include dual rear cameras (e.g., a primary camera as well as a depth-sensing camera), or even triple, quad, or penta rear camera configurations on the front and rear sides of the client device **102**. These multiple cameras systems may include a wide camera, an ultra-wide camera, a telephoto camera, a macro camera, and a depth sensor, for example.

The position components **1234** include location sensor components (e.g., a GPS receiver component), altitude sensor components (e.g., altimeters or barometers that detect air pressure from which altitude may be derived), orientation sensor components (e.g., magnetometers), and the like.

Communication may be implemented using a wide variety of technologies. The I/O components **1238** further include communication components **1236** operable to couple the machine **1200** to a network **1220** or devices **1222** via respective coupling or connections. For example, the communication components **1236** may include a network interface component or another suitable device to interface with the network **1220**. In further examples, the communication components **1236** may include wired communication components, wireless communication components, cellular communication components, Near Field Communication (NFC) components, Bluetooth® components (e.g., Bluetooth® Low Energy), Wi-Fi® components, and other communication components to provide communication via other modalities. The devices **1222** may be another machine or any of a wide variety of peripheral devices (e.g., a peripheral device coupled via a USB).

Moreover, the communication components **1236** may detect identifiers or include components operable to detect identifiers. For example, the communication components **1236** may include Radio Frequency Identification (RFID) tag reader components, NFC smart tag detection components, optical reader components (e.g., an optical sensor to detect one-dimensional bar codes such as Universal Product Code (UPC) bar code, multi-dimensional bar codes such as Quick Response (QR) code, Aztec code, Data Matrix, Dataglyph, MaxiCode, PDF417, Ultra Code, UCC RSS-2D bar code, and other optical codes), or acoustic detection components (e.g., microphones to identify tagged audio signals). In addition, a variety of information may be derived via the communication components **1236**, such as location via Internet Protocol (IP) geolocation, location via Wi-Fi® signal triangulation, location via detecting an NFC beacon signal that may indicate a particular location, and so forth.

The various memories (e.g., main memory **1212**, static memory **1214**, and memory of the processors **1202**) and storage unit **1216** may store one or more sets of instructions and data structures (e.g., software) embodying or used by any one or more of the methodologies or functions described herein. These instructions (e.g., the instructions **1208**), when executed by processors **1202**, cause various operations to implement the disclosed examples.

The instructions **1208** may be transmitted or received over the network **1220**, using a transmission medium, via a network interface device (e.g., a network interface component included in the communication components **1236**) and using any one of several well-known transfer protocols (e.g., HTTP). Similarly, the instructions **1208** may be transmitted or received using a transmission medium via a coupling (e.g., a peer-to-peer coupling) to the devices **1222**.

Software Architecture

FIG. **13** is a block diagram **1300** illustrating a software architecture **1304**, which can be installed on any one or more of the devices described herein. The software architecture **1304** is supported by hardware such as a machine **1302** that includes processors **1320**, memory **1326**, and I/O components **1338**. In this example, the software architecture **1304** can be conceptualized as a stack of layers, where each layer provides a particular functionality. The software architecture **1304** includes layers such as an operating system **1312**, libraries **1310**, frameworks **1308**, and applications **1306**. Operationally, the applications **1306** invoke API calls **1350** through the software stack and receive messages **1352** in response to the API calls **1350**.

The operating system **1312** manages hardware resources and provides common services. The operating system **1312** includes, for example, a kernel **1314**, services **1316**, and drivers **1322**. The kernel **1314** acts as an abstraction layer between the hardware and the other software layers. For example, the kernel **1314** provides memory management, processor management (e.g., scheduling), component management, networking, and security settings, among other functionality. The services **1316** can provide other common services for the other software layers. The drivers **1322** are

responsible for controlling or interfacing with the underlying hardware. For instance, the drivers **1322** can include display drivers, camera drivers, BLUETOOTH® or BLUETOOTH® Low Energy drivers, flash memory drivers, serial communication drivers (e.g., USB drivers), WI-FI® drivers, audio drivers, power management drivers, and so forth.

The libraries **1310** provide a common low-level infrastructure used by the applications **1306**. The libraries **1310** can include system libraries **1318** (e.g., C standard library) that provide functions such as memory allocation functions, string manipulation functions, mathematic functions, and the like. In addition, the libraries **1310** can include API libraries **1324** such as media libraries (e.g., libraries to support presentation and manipulation of various media formats such as Moving Picture Experts Group-4 (MPEG4), Advanced Video Coding (H.264 or AVC), Moving Picture Experts Group Layer-3 (MP3), Advanced Audio Coding (AAC), Adaptive Multi-Rate (AMR) audio codec, Joint Photographic Experts Group (JPEG or JPG), or Portable Network Graphics (PNG)), graphics libraries (e.g., an OpenGL framework used to render in two dimensions (2D) and three dimensions (3D) in a graphic content on a display), database libraries (e.g., SQLite to provide various relational database functions), web libraries (e.g., WebKit to provide web browsing functionality), and the like. The libraries **1310** can also include a wide variety of other libraries **1328** to provide many other APIs to the applications **1306**.

The frameworks **1308** provide a common high-level infrastructure that is used by the applications **1306**. For example, the frameworks **1308** provide various graphical user interface functions, high-level resource management, and high-level location services. The frameworks **1308** can provide a broad spectrum of other APIs that can be used by the applications **1306**, some of which may be specific to a particular operating system or platform.

In an example, the applications **1306** may include a home application **1336**, a contacts application **1330**, a browser application **1332**, a book reader application **1334**, a location application **1342**, a media application **1344**, a messaging application **1346**, a game application **1348**, and a broad assortment of other applications such as a third-party application **1340**. The applications **1306** are programs that execute functions defined in the programs. Various programming languages can be employed to create one or more of the applications **1306**, structured in a variety of manners, such as object-oriented programming languages (e.g., Objective-C, Java, or C++) or procedural programming languages (e.g., C or assembly language). In a specific example, the third-party application **1340** (e.g., an application developed using the ANDROID™ or IOS™ SDK by an entity other than the vendor of the particular platform) may be mobile software running on a mobile operating system such as IOS™, ANDROID™, WINDOWS® Phone, or another mobile operating system. In this example, the third-party application **1340** can invoke the API calls **1350** provided by the operating system **1312** to facilitate functionality described herein.

GLOSSARY

"Carrier signal" refers to any intangible medium that is capable of storing, encoding, or carrying instructions for execution by the machine, and includes digital or analog communications signals or other intangible media to facilitate communication of such instructions. Instructions may be transmitted or received over a network using a transmission medium via a network interface device.

"Client device" refers to any machine that interfaces to a communications network to obtain resources from one or more server systems or other client devices. A client device may be, but is not limited to, a mobile phone, desktop computer, laptop, PDAs, smartphones, tablets, ultrabooks, netbooks, laptops, multi-processor systems, microprocessor-based or programmable consumer electronics, game consoles, set-top boxes, or any other communication device that a user may use to access a network.

"Communication network" refers to one or more portions of a network that may be an ad hoc network, an intranet, an extranet, a virtual private network (VPN), a local area network (LAN), a wireless LAN (WLAN), a wide area network (WAN), a wireless WAN (WWAN), a metropolitan area network (MAN), the Internet, a portion of the Internet, a portion of the Public Switched Telephone Network (PSTN), a plain old telephone service (POTS) network, a cellular telephone network, a wireless network, a Wi-Fi® network, another type of network, or a combination of two or more such networks. For example, a network or a portion of a network may include a wireless or cellular network and the coupling may be a Code Division Multiple Access (CDMA) connection, a Global System for Mobile communications (GSM) connection, or other types of cellular or wireless coupling. In this example, the coupling may implement any of a variety of types of data transfer technology, such as Single Carrier Radio Transmission Technology (1×RTT), Evolution-Data Optimized (EVDO) technology, General Packet Radio Service (GPRS) technology, Enhanced Data rates for GSM Evolution (EDGE) technology, third Generation Partnership Project (3GPP) including 3G, fourth generation wireless (4G) networks, Universal Mobile Telecommunications System (UMTS), High Speed Packet Access (HSPA), Worldwide Interoperability for Microwave Access (WiMAX), Long Term Evolution (LTE) standard, others defined by various standard-setting organizations, other long-range protocols, or other data transfer technology.

"Component" refers to a device, physical entity, or logic having boundaries defined by function or subroutine calls, branch points, APIs, or other technologies that provide for the partitioning or modularization of particular processing or control functions. Components may be combined via their interfaces with other components to carry out a machine process. A component may be a packaged functional hardware unit designed for use with other components and a part of a program that usually performs a particular function of related functions. Components may constitute either software components (e.g., code embodied on a machine-readable medium) or hardware components. A "hardware component" is a tangible unit capable of performing certain operations and may be configured or arranged in a certain physical manner. In various example embodiments, one or more computer systems (e.g., a standalone computer system, a client computer system, or a server computer system) or one or more hardware components of a computer system (e.g., a processor or a group of processors) may be configured by software (e.g., an application or application portion) as a hardware component that operates to perform certain operations as described herein. A hardware component may also be implemented mechanically, electronically, or any suitable combination thereof. For example, a hardware component may include dedicated circuitry or logic that is permanently configured to perform certain operations. A hardware component may be a special-purpose processor,

such as a field-programmable gate array (FPGA) or an ASIC. A hardware component may also include programmable logic or circuitry that is temporarily configured by software to perform certain operations. For example, a hardware component may include software executed by a general-purpose processor or other programmable processor. Once configured by such software, hardware components become specific machines (or specific components of a machine) uniquely tailored to perform the configured functions and are no longer general-purpose processors. It will be appreciated that the decision to implement a hardware component mechanically, in dedicated and permanently configured circuitry, or in temporarily configured circuitry (e.g., configured by software), may be driven by cost and time considerations. Accordingly, the phrase "hardware component" (or "hardware-implemented component") should be understood to encompass a tangible entity, be that an entity that is physically constructed, permanently configured (e.g., hardwired), or temporarily configured (e.g., programmed) to operate in a certain manner or to perform certain operations described herein. Considering embodiments in which hardware components are temporarily configured (e.g., programmed), each of the hardware components need not be configured or instantiated at any one instance in time. For example, where a hardware component comprises a general-purpose processor configured by software to become a special-purpose processor, the general-purpose processor may be configured as respectively different special-purpose processors (e.g., comprising different hardware components) at different times. Software accordingly configures a particular processor or processors, for example, to constitute a particular hardware component at one instance of time and to constitute a different hardware component at a different instance of time. Hardware components can provide information to, and receive information from, other hardware components. Accordingly, the described hardware components may be regarded as being communicatively coupled. Where multiple hardware components exist contemporaneously, communications may be achieved through signal transmission (e.g., over appropriate circuits and buses) between or among two or more of the hardware components. In embodiments in which multiple hardware components are configured or instantiated at different times, communications between such hardware components may be achieved, for example, through the storage and retrieval of information in memory structures to which the multiple hardware components have access. For example, one hardware component may perform an operation and store the output of that operation in a memory device to which it is communicatively coupled. A further hardware component may then, at a later time, access the memory device to retrieve and process the stored output. Hardware components may also initiate communications with input or output devices and can operate on a resource (e.g., a collection of information). The various operations of example methods described herein may be performed, at least partially, by one or more processors that are temporarily configured (e.g., by software) or permanently configured to perform the relevant operations. Whether temporarily or permanently configured, such processors may constitute processor-implemented components that operate to perform one or more operations or functions described herein. As used herein, "processor-implemented component" refers to a hardware component implemented using one or more processors. Similarly, the methods described herein may be at least partially processor-implemented, with a particular processor or processors being an example of hardware. For example, at least some of the operations of a method may be performed by one or more processors or processor-implemented components. Moreover, the one or more processors may also operate to support performance of the relevant operations in a "cloud computing" environment or as a "software as a service" (SaaS). For example, at least some of the operations may be performed by a group of computers (as examples of machines including processors), with these operations being accessible via a network (e.g., the Internet) and via one or more appropriate interfaces (e.g., an API). The performance of certain of the operations may be distributed among the processors, not only residing within a single machine, but deployed across a number of machines. In some example embodiments, the processors or processor-implemented components may be located in a single geographic location (e.g., within a home environment, an office environment, or a server farm). In other example embodiments, the processors or processor-implemented components may be distributed across a number of geographic locations.

"Computer-readable storage medium" refers to both machine-storage media and transmission media. Thus, the terms include both storage devices/media and carrier waves/modulated data signals. The terms "machine-readable medium," "computer-readable medium," and "device-readable medium" mean the same thing and may be used interchangeably in this disclosure.

"Ephemeral message" refers to a message that is accessible for a time-limited duration. An ephemeral message may be a text, an image, a video, and the like. The access time for the ephemeral message may be set by the message sender. Alternatively, the access time may be a default setting or a setting specified by the recipient. Regardless of the setting technique, the message is transitory.

"Machine storage medium" refers to a single or multiple storage devices and media (e.g., a centralized or distributed database, and associated caches and servers) that store executable instructions, routines, and data. The term shall accordingly be taken to include, but not be limited to, solid-state memories, and optical and magnetic media, including memory internal or external to processors. Specific examples of machine-storage media, computer-storage media and device-storage media include non-volatile memory, including by way of example semiconductor memory devices, e.g., erasable programmable read-only memory (EPROM), electrically erasable programmable read-only memory (EEPROM), FPGA, and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and CD-ROM and DVD-ROM disks The terms "machine-storage medium," "device-storage medium," "computer-storage medium" mean the same thing and may be used interchangeably in this disclosure. The terms "machine-storage media," "computer-storage media," and "device-storage media" specifically exclude carrier waves, modulated data signals, and other such media, at least some of which are covered under the term "signal medium."

"Non-transitory computer-readable storage medium" refers to a tangible medium that is capable of storing, encoding, or carrying the instructions for execution by a machine.

"Signal medium" refers to any intangible medium that is capable of storing, encoding, or carrying the instructions for execution by a machine and includes digital or analog communications signals or other intangible media to facilitate communication of software or data. The term "signal medium" shall be taken to include any form of a modulated

data signal, carrier wave, and so forth. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a matter as to encode information in the signal. The terms "transmission medium" and "signal medium" mean the same thing and may be used interchangeably in this disclosure.

What is claimed is:

1. A method comprising:

receiving a first message via a main conversation view on a first device associated with a first user, the main conversation view being associated with a group conversation between a plurality of users;

determining that a second user from the plurality of users is active in an experience page associated with the group conversation, the experience page being accessible from the main conversation view; and

causing display of a second message in the experience page on a second device associated with the second user, the second message, upon being displayed, including content of the first message and a graphical element representing the main conversation view from which the first message is received, content of a plurality of messages caused to be displayed in the main conversation view matching content of a plurality of messages caused to be displayed in the experience page.

2. The method of claim **1**, wherein the experience page corresponds to a user interface associated with one of a media content item, a web-based external resource, a video call, or an audio call.

3. The method of claim **2**, wherein the media content item corresponds to one of an image, a video, an audio, or a web link.

4. The method of claim **1**, comprising:

detecting, via the second device associated with the second user, an occurrence of one or more user interactions with the experience page within a predetermined time period; and

in response to the detecting of the occurrence of the one or more user interactions, determining that the second user is active within the experience page.

5. The method of claim **1**, wherein the experience page comprises a text input region for receiving one or more messages associated with the group conversation.

6. The method of claim **1**, comprising:

receiving a third message associated with the group conversation; and

determining that the third message was transmitted via the experience page on the first device within a predetermined time period.

7. The method of claim **6**, comprising:

in response to determining that the third message was transmitted via the experience page on the first device within a predetermined time period, determining that both the first user and the second user are active within the experience page; and

causing display of content of the third message on the second device, the content of the third message being displayed without the graphical element representing the experience page.

8. The method of claim **6**, comprising:

determining that the second user is not active within the experience page; and

causing display of content of the third message on the second device, the content of the third message being displayed together with the graphical element representing the experience page.

9. The method of claim **1**, further comprising:

detecting, via the second device, an indication of a user selection of the graphical element;

determining that the experience page has not been previously accessed by the second user; and

in response to detecting the indication of the user selection of the graphical element, causing display of the experience page in a full-screen display on the second device.

10. The method of claim **1**, wherein the second message, upon being displayed on the second device, is viewable up to a threshold period of time.

11. A system comprising:

one or more processors; and

a non-transitory computer readable storage medium comprising instructions that when executed by the one or more processors cause the one or more processors to perform operations comprising:

receiving a first message via a main conversation view on a first device associated with a first user, the main conversation view being associated with a group conversation between a plurality of users;

determining that a second user from the plurality of users is active in an experience page associated with the group conversation, the experience page being accessible from the main conversation view; and

causing display of a second message in the experience page on a second device associated with the second user, the second message, upon being displayed, including content of the first message and a graphical element representing the main conversation view from which the first message is received, content of a plurality of messages caused to be displayed in the main conversation view matching content of a plurality of messages caused to be displayed in the experience page.

12. The system of claim **11**, wherein the experience page corresponds to a user interface associated with one of a media content item, a web-based external resource, a video call, or an audio call.

13. The system of claim **12**, wherein the media content item corresponds to one of an image, a video, an audio, or a web link.

14. The system of claim **11**, wherein the operations comprise:

detecting, via the second device associated with the second user, an occurrence of one or more user interactions with the experience page within a predetermined time period; and

in response to the detecting of the occurrence of the one or more user interactions, determining that the second user is active within the experience page.

15. The system of claim **11**, wherein the experience page comprises a text input region for receiving one or more messages associated with the group conversation.

16. The system of claim **11**, wherein the operations comprise:

receiving a third message associated with the group conversation; and

determining that the third message was transmitted via the experience page on the first device within a predetermined time period.

17. The system of claim **16**, wherein the operations comprise:

in response to determining that the third message was transmitted via the experience page on the first device

within a predetermined time period, determining that both the first user and the second user are active within the experience page; and

causing display of content of the third message on the second device, the content of the third message being displayed without the graphical element representing the experience page.

18. The system of claim **16**, wherein the operations comprise:

determining that the second user is not active within the experience page; and

causing display of content of the third message on the second device, the content of the third message being displayed together with the graphical element representing the experience page.

19. The system of claim **11**, wherein the operations comprise:

detecting, via the second device, an indication of a user selection of the graphical element;

determining that the experience page has not been previously accessed by the second user; and

in response to detecting the indication of the user selection of the graphical element, causing display of the experience page in a full-screen display on the second device.

20. A machine-readable non-transitory storage medium having instruction data executable by a machine to cause the machine to perform operations comprising:

receiving a first message via a main conversation view on a first device associated with a first user, the main conversation view being associated with a group conversation between a plurality of users;

determining that a second user from the plurality of users is active in an experience page associated with the group conversation, the experience page being accessible from the main conversation view; and

causing display of a second message in the experience page on a second device associated with the second user, the second message, upon being displayed, including content of the first message and a graphical element representing the main conversation view from which the first message is received, content of a plurality of messages caused to be displayed in the main conversation view matching content of a plurality of messages caused to be displayed in the experience page.

* * * * *